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The Late Mr. Charles B. Vignoles.

THE death of this eminent gentleman has severed one of the few remaining links which united the present generation of civil engineers with that which, some fifty years since, obtained for England the honour of the first invention and introduction of the railway system. Mr. Vignoles was prominent amongst this early band of engineers, of which George and Robert Stephenson were the chiefs, and which comprised, besides his own, the honoured names of Brunel, Locke, Bidder, Hawkshaw, and others of high repute in railway history. We feel assured, therefore, that the following brief memoir will be perused with no ordinary interest.

Mr. Vignoles was born in 1792, and had, accordingly, attained the age of eighty-three at his death, on the 17th instant. The family of Mr. Vignoles is of very ancient origin, from Languedoc, and their founder, Étienne des Vignolles, proved four generations of "*noblesse*," when his titles were granted, in the old French chronicles, in the fourteenth or fifteenth century. The senior branch, the De Vignolls, of Prades, embraced the Protestant faith, and emigrated, some to Holland, and afterwards to Ireland, and settled at Portarlington, and many appear serving in the English army as officers. His father, a young captain in the 43rd regiment of Infantry, married Camilla Hutton, daughter of Dr. Hutton, the Professor of Mathematics at Woolwich, and afterwards they went to Ireland, where the subject of our notice was born. The regiment was then ordered out to the West Indies, the young wife and infant going also. Captain Vignoles was taken prisoner by the French, when they retook the island of Guadaloupe, and he and his wife both died of yellow fever within a few hours of each other, leaving the infant a little prisoner of war. His uncle, General Hutton, then Major Hutton, regained the infant when exchange of prisoners was made, and he had been kindly cared for by the family of a French officer of position, by name Courtois, and Major Hutton brought the infant and his nurse safely to England, where he was brought up by his grandfather, Dr. Hutton. General Hutton was the father of the Rev. Henry Hutton, the much-esteemed and greatly-beloved late Rector of St. Paul's, Covent Garden; and the only male representative of that family now is Major Hutton, of the 23rd Fusiliers, which regiment distinguished itself in the late Ashantee war.

Mr. Vignoles frequently related, as a curious characteristic of those times, that he received at that early age a commission in the army as a provision; and that his commission was probably of earlier date than that of any other British officer living.

Mr. Vignoles joining the Duke of Kent's own regiment, was engaged for a short period on active service in the Peninsular War and in France before the conclusion of our wars with the first Napoleon. He displayed, even at this early age, the ability and energy by which he became subsequently so much distinguished. Leaving the army after the close of the war in 1815, he visited the United States, and made topographical surveys of portions of Florida and South Carolina; and subsequently surveyed for the English Government a considerable portion of the Isle of Man. His railway career commenced in 1825, when he was engaged on the survey of the then projected Liverpool and Manchester Railway, and the following extract from his presidential address to the Institution of Civil Engineers in 1870 contains some interesting reminiscences of that period:—

"It happened," says Mr. Vignoles, "that I had returned, some two years previously, from occupations on the Continent and in North America, both civil and military, all connected with engineering, occasioning repeated absences from this country. Having watched the few railways then made or making, I was fortunate in being selected by Messrs. Rennie to take charge of the new surveys, which the Liverpool committee immediately ordered under the direction of those eminent engineers. But the opposition of canal owners and land proprietors had become redoubled; and it was in the course of carrying out this duty that I was brought into contact with the celebrated Mr. Bradshaw, the devoted trustee under the remarkable will of that Duke of Bridgwater who employed Brindley to make his canals, and had charged Mr. Bradshaw, for the benefit of his future heirs, with the sole and absolute control of them, and of his large estates, which he exercised for nearly half a century.

I was brought up before Mr. Bradshaw, at Worsley Hall, on a pretended charge of night poaching and trespassing; for I was often obliged to make surveys and take levels by moonlight and torchlight, so strict was the watch kept by day, by order of many landowners, to prevent engineers from completing the necessary plans and sections. Mr. Bradshaw had contrived to earn himself a terrible name for severity; but I found him a gentleman. My only reason for recurring to such a mere personal adventure is, that some not unfriendly discourse passed between us on that occasion, which I communicated to the Liverpool committee. This led, I have good reasons for believing, to communications which, before the close of 1825, ended in those arrangements by which the then Marquis of Stafford, for himself and those of his family who were ultimately to benefit in the profits of the Duke of Bridgwater's canal, took 1,000 shares in the Liverpool and Manchester Railway Company, with the privilege of nominating three of the directors,—arrangements confirmed by the company's first Act of Parliament."

The early appreciation by Mr. Vignoles of the effects of the railway system was remarkably shown by the following further extracts from his presidential address, in relation to the same early period, which we cannot refrain from quoting:—

"A great gathering of engineers from all parts was, of course, in Liverpool; and as Englishmen are said not to get on well on important business without dinner demonstrations, the engineers gave on this occasion a grand banquet to the directors and officers of the railway, and to the competing locomotive engine-builders. Of course speeches were made and healths drunk, and we toasted each other and everybody, except the waiters. Will you excuse me if I read from a newspaper report of our feast (in the *Liverpool Albion* of the 12th of October, 1829), two short predictions of mine about railways? I had had the honour assigned to me of returning thanks for the toast of 'The President and Institution of Civil Engineers,' and what I said is thus reported:—'Mr. Vignoles, as a member of the Institution, returned thanks for Mr. Telford, to whom, as the constructor of many of our most important public works, the toast was due. His (Mr. Vignoles's) first step in life was as a military rather than a civil engineer; and as he was deputed to propose a military toast, perhaps he might preface it by some anticipation of what steam would do in a military point of view. Supposing such a general as Napoleon were to effect a landing on our coast with a large and powerful army, and that he even were to be victorious upon his landing; armed as this country is shortly to be with railroads and locomotive engines, brief would be his triumph, *for by return of post, as it were, parks of artillery and the whole military force of the country could be poured upon him, without even the fatigue of a march.* Mr. Vignoles concluded by giving 'The Master-General of the Ordnance and Corps of Royal Engineers.'" And a little later in the evening, having had to propose "The Health of the Three Judges of the Locomotive Competition," he said,—"Being engaged in laying out a railway between Goole and Barnsley, he (Mr. Vignoles) hoped to see that accomplished and made part of the union between the two sides of the kingdom, and that it might put it into the power of that part of the country to supply the metropolis with the article coal, at present furnished through sea transport by the great Northern proprietors, whose monopoly he trusted would then soon be put down."

It is needless to comment on the manner in which railways have since, throughout the world, both subserved military purposes, and been made available for the transport of coal.

Mr. Vignoles subsequently took part in the famous Rainhill locomotive competition in 1829, when the "Rocket" engine of George Stephenson

obtained the prize of 500*l.*, and became the model upon which all railway locomotives were subsequently constructed. From this period his reputation was established, and he filled a leading position in the engineering profession. He was engaged as engineer-in-chief to the North Union, the Midland Counties, and the Dublin and Kingstown railways, the latter being the first railway constructed in Ireland; and he was connected, more or less intimately, with numerous other lines, both at home and abroad. His foreign works comprised, amongst many others of minor character, the great suspension bridge at Kieff, in Russia, comprising six spans of 440 ft. each; the Bahia and San Francisco Railway in Brazil; the Frankfort and Wiesbaden Railway; the Warsaw Teresbol Railway; and the Bilboa and Tudela Railway in Spain, the latter being over the ground upon which, many years before, he had commenced his military life during Wellington's campaigns in the Peninsula. He was elected a member of the Institution of Civil Engineers in 1827, nine years after its establishment, and a year before its incorportion; and he became its president in 1870. He was a fellow of the Royal Society and a fellow of the Royal Astronomical Society, and he is honourably recorded for useful services to the latter Association.

Mr. Vignoles was a man of unwearied energy, ardent temperament, and great constitutional power. His work was ever performed with remarkable conscientiousness and care, and his minute attention to laying out railways on the most advantageous ground available, and so economising the funds entrusted to his disposal, was remarkable from the commencement of his career. He first adopted, with this object, the system of marking the levels of the ground in figures on his railway plans (as is done, for instance, on the Ordnance maps of London), thus obtaining in effect the advantage of possessing a model of the ground in the office. He was the inventor of the flat-bottomed rail, which is known throughout the world by his name, and is coming every year into more extended use. He was, as already stated, remarkably far-sighted in matters connected with his profession. He strongly advocated economy of construction; and even in the early days of railways, when the most eminent engineers believed generally in the necessity of easy gradients and flat curves, he constantly maintained, as well in his practice as in discourse, the advisability of economising construction by the adoption of more severe curves and gradients, and of overcoming their resistance to traction by increasing the powers of the locomotive, as the true principle of railway construction. He died full of years and honours, and is universally regretted by his profession and by all who knew him.

Mr. Vignoles has left a widow, now very seriously ill, one daughter (Mrs. Croudace), and three sons,—Mr. Hutton Vignoles, Mr. Henry Vignoles, just now returned from Bosnia, and the Rev. Olinthus Vignoles. His eldest grandson, and pupil, Charles Hutton Croudace, is now Executive Engineer on the State Railways in Rajpootana, at Ajmere.

THE EIGHTEENTH CENTURY IN FRANCE.

A FEW months since we noticed at some length* the comprehensive summary by M. Lacroix of the religious and military life of the Middle Ages, reproducing some of the illustrations which seemed to be of special interest or curiosity. We have now before us, in a large and handsome volume, the same author's last contribution† to the series of works which he is carrying out in elucidation of the history of France from a social rather than a political stand-point. His former histories of the Life of the Renaissance and of the Middle-Age periods having met with acceptance, the object of the present volume on the eighteenth century is, as pointed out in the preface, to complete the picture of French society from its origin, and that of the monarchy, down to the date of 1789, which ushered in a new order of things. Without following a strict chronological order, which might have given rise to difficulties in compilation, and omitting general facts of history and incidents of war and politics, which would have required a larger scope, "the author has confined his labours to the consideration of manners, customs public and private, costume, arts, sciences, and literature; and this picturesque and descriptive kind of history seems of a nature to satisfy that justifiable curiosity which characterises the present epoch, bringing before us as it does a past, the study of which, in all its varied phases, will help us to form a judgment of the present."

Intensely interesting as is the eighteenth century in France, in view of its peculiarly brilliant social and intellectual development,—the former the over-wrought luxury, mental and physical, of a system of society on the high road to its fall, the latter almost unconsciously preparing the way for the demolition of that very order of society which it dazzled and delighted,—it affords less opportunity for touching on matters of artistic interest, or which directly concern a journal mainly artistic in its scope, than the former works of M. Lacroix, which we noticed. The arts and constructions of the Middle Ages, the art of the Renaissance, are excellent in themselves, and present abundant scope for illustration with the pencil as well as with the pen; the art of the eighteenth century is of far inferior value *per se*, and, moreover, is much less intimately bound up with the subject than is the case in regard to the other periods alluded to; the intellectual achievements of the eighteenth century being literary rather than artistic, and what art there was being more a matter of ornament and luxury than of serious interest to the society of the period. The incongruity and false taste of the time in regard to art are well enough symbolised in the "cartouche frontispiece, after Meissonnier," a curious instance how the very force of bad taste can be combined with real cleverness and sparkle of design. But the decorative art at least of the period can hardly interest even in an illustrative sense; it is the result mostly of merely mechanical tricks of design, accepted as the correct thing by the society of the day without criticism or questioning; and has none of that vital interest of style and feeling which attaches often to even the smallest bit of Mediæval workmanship or of Renaissance draughtsmanship. In another way, however, the author has pressed the pictorial art of the period into his service to some purpose; illustrating costumes and social manners and character to a great extent by engravings from scenes and figures by the leading painters of the epoch, who, if not a very imaginative or elevated school of artists, painted faithfully and with no little insight and spirit the life which they saw around them, and among whose ranks are included one or two names at least of men of unquestionable genius.

We open at the commencement of the eighteenth century on a period in which gaiety and splendour were matters of outer form rather than of reality; when in the latter years of Louis le Grand king and kingdom alike had lost much of their prestige, and the tone of the Court was all the more gloomy in reality for the perpetual effort to ward off *ennui* by *fêtes* and splendours which had lost their zest. The old *éclat* and animation was regained under Louis XV., and two records of the enjoyments of the period are given us; one in the engraving of the representation of Voltaire's comedy-ballad, "The Princesse of Navarre," in the riding-school at Versailles,—the room decorated with the lavish and gaudy splendour of the period, and the majority of the Court audience sitting sideways to the stage facing each other, so as to leave a centre space for the uninterrupted view of the king and queen; the other the card inviting to a "Bal-paré" at Versailles on the same occasion, the marriage of the Dauphin. It is curious to look at this *fac simile* of the ball-card, the only relic of the festivity of "Le Mercredi, 24 Février, 1745," with its daintily-devised border of knops and scrolls, Cupids and fiddles, in the manner we know so well. A very pretty chromo-lithograph (p. 76) gives the precise appearance of an interior in the time of Louis XVI., much as it may be seen "in the round," though on a smaller scale, in the corner of one of the South Kensington Courts. Artificial and mannered as the style is, with its gilt garlands over the doors and arches, and its Cupids kicking about with more gilt garlands in a ceiling of clouds, there is a unity of effect about the whole which one must recognise; and as an expression of a highly-artificial life such an artificial style becomes almost natural, if one may speak in paradox. As a significant set-off to this pretty and finical interior, with its delicate grey and pink tints and gold pickings, and the refined-looking occupant sitting among her books and music, we may refer to the illustration of "The Ramponeaux Tavern" (p. 88), kept by Jean Ramponeaux (apparently a fac-simile of an old print), where the people found their enjoyment; a long bare room, filled with deal tables and crowded with a motley and evidently very noisy set of revellers; the walls scrawled over with misshapen or ludicrous figures by way of decoration. The meanness and squalor of the place, a principal public resort of the day, is an instructive and telling contrast to the contemporary boudoir style. Some remarks of Voltaire, quoted in conjunction with the subject (in the chapter on "The People"), are curious, as a view of the popular education question at that period by the keenest intellect of the day. In a letter written in 1766, he says:—"I think we are not quite agreed upon the meaning of the word *people*, whom you think worthy of receiving an education. I mean by *people* the populace which has only manual labour for their support. I question whether this order of citizens can ever have the time or the capacity for instruction; they would die of hunger before they are educated. Thus it seems to me essential that there should be some ignorant clowns. . . . . When the people take to reasoning, there will be an end of everything." If Voltaire could use this language in the eighteenth century, there is some excuse for the English squirearchy who used it in the beginning of the nineteenth century, and who could hardly be expected to see straighter in their day than a Voltaire in his. Apparently rather in contradiction to this last judgment, and certainly with more insight, we find the great wit remarking, in another quotation,—"All is not lost so long as the people are in a condition to see that they have a mind. But the worst may be looked for when they are treated like a herd of oxen, for sooner or later they will goad you with their horns." Nothing could be more comprehensive,—the whole French Revolution in a nutshell.

The chapters on the army and navy contain a great variety of information, and are largely illustrated; among the naval illustrations is one of the poop of the *Invincible*, a seventy-four which was captured by the English in the Revolution war, and which, we are informed in a note, they admired so much as to construct thirty-six new vessels on the same model. This, we should say, "wants confirmation." The illustration, which is intended merely to give a notion of the sumptuous decoration of the poop, reminds us of the dry sarcasm in an old naval dictionary of the war time, where, under the heading "Stern," it was ingenuously confessed that the French shipbuilders had much surpassed the English in the decoration of this portion of the vessel, which was only to be expected, as it was the part of their ships which was most prominently exhibited to the enemy. However, we must pass over this and several other chapters, and say a word about the "aspect of Paris." In 1720 it was still the noisy, dirty, populous town which Boileau had described sixty years before in his satire "Les Embarras de Paris." The general aspect of the people and character of its inhabitants had not changed for more than a century; and though Louis XIV. made some important public *places*, he did little to alter the character of the city normally. It was considered remarkable in that day for the height of its houses, running up to six or seven stories, and inhabited in flats in the manner which is still extensively adhered to. The Paris of this period, indeed, must have been in the character of its structures rather akin to the older parts of Edinburgh, as far as one can judge from contemporary description. But about the end of the first quarter of the century it was perceptible that Paris was undergoing a change, and was gradually putting off its Mediæval character and beginning to lend itself to the modifications required by the altered customs of its inhabitants. The centralisation in Paris seems to have been very marked at this time, to such an extent that "economists" apprehended the depopulation of the provinces. "Knock at all the doors from the highest to the lowest," wrote the Marquis de Mirabeau, "and you will hear people talking in every language and every idiom. I will be bound that you will not find more than three per cent. of the population natives of Paris." People could not understand what became of the native inhabitants of Paris, and wondered whether they in turn did not leave their homes to seek their fortune elsewhere; and the Marquis de Mirabeau, in re-

* See p. 161, *ante*.

† The Eighteenth Century: its Institutions, Customs, and Costumes. France, 1700-1789. By Paul Lacroix, Curator of the Imperial Library of the Arsenal, Paris. Illustrated with twenty-one chromo-lithographs and 351 wood-engravings after Watteau, Vanloo, Rigaud, &c. London: Chapman & Hall.

ference to this point, says: "Everybody marries, but what becomes of their children?" and he arrived at the conclusion that "the offspring of the great cities is a pure loss to humanity, and that they die off without its being possible to say what becomes of them." It is something for the progress of sanitary science and the art of living generally that we need no longer hold quite so unfortunate a creed as this; yet the question of the influence of crowded cities on human life is one continually before us, and in regard to which much has yet to be answered. Of some of the more incidental *désagrémens* of life in Paris at the period we are speaking of, the following passage may give an idea:—

"The highway was not kept in better order than the houses adjoining it, being only repaired at rare intervals; it was, indeed, difficult to ascertain when the roadway wanted repair, concealed, as it nearly always was, beneath a layer of dung, rubbish, or thick mud. The drain in the middle of the streets to carry off the water from the houses formed a stagnant pool, which was stirred up by the carriage-wheels and horses' hoofs. Mercier (*Tableau de Paris*) says:—'When it rains there is a wide stream, swollen by the outflow from the shoots, and over this a moveable bridge is laid. The man in charge of this construction lifts it up to let carriages pass, and expects to be paid a *liard* for his trouble. You will see this at the corner of the Rue Triquetonne any day after a heavy storm. If the plank which forms the bridge happens to break, foot-passengers must be carried across if they do not want to get their feet wet.' There were high stone pillars, some of them hooped with iron to prevent the wheels from grating against the walls of the houses; and behind these the luckless pedestrians were often glad to take refuge."

These friendly posts were, in their day, the counterparts apparently of our safety lamps and posts in the centres of the thoroughfare. But the very graphic illustration, after Garnier, of "Crossing the Gutter after a Thunderstorm,"—a hatted and feathered young lady getting carried across the turbid stream, pick-a-back fashion, by a bare-legged man,—says more than pages of description. In the matter of noise, the Paris streets must have been as undesirable as in that of drainage, to judge from the descriptions of the number and intensity of the street-cries of the period; nuisances which, though more varied, could hardly have been more uncouth, unmeaning, and discordant than those which are still to be heard in many parts of our own capital, which seems to admit and even cherish nuisances that no third-rate country-town would tolerate. The Paris cries are presented or symbolised to our eyes, at least, by the author, in the number of curious and characteristic representations he has collected, occupying several pages, of the different types of street tradespeople of the period. The only bit of decoration from the Paris streets of the period is a hotel lamp in "ornamental wrought-iron," where the lamp is pendent from the end of a curling, cabbagy-looking scroll, which seems too flabby even to bear its own weight; the detail is significant enough of the taste of the time in such species of workmanship.

The chapter on "Fête-days and Amusements" includes some spirited illustrations of popular festivities, among others a representation, a little bordering on caricature, but spirited enough, of the gay crowd in the Palais-Royal Gardens, when it was the favourite and fashionable lounge before the opera. Among the spectacular inventions of the day are figured two masquerade state chariots, the "chariot of Mars," and the "chariot of Hymen," which seem almost too extravagant in design and construction to be true. The intense popular interest excited by the invention and trials of balloons, towards the close of the century, is worth noticing. It was believed that a new way of travelling had been discovered, and crowds came to see Montgolfier's and other balloons started, and indulged the greatest enthusiasm on the subject. It is somewhat curious, certainly, that in all this time we have scarcely got a step further in rendering these air-ships manageable. In the chapter on "The Kitchen and the Table" (a subject which has more historical and social interest than it sometimes gets credit for), we come upon the change from the abundant to the *recherché* style of dinner-service. An immense place was filled by the dinner, both in regard to time and space, in the earlier half of the century; indeed, it was said by one contemporary writer that during "the Regency" eating was the chief occupation of the time. The dinner-service included immense dishes of whole animals, or nearly so, which were called *dormants*, as being stationary, and not handed round. When a more refined taste began to take exception to these masses of meat, their place was taken by smaller dishes, and the table-service was quite transformed, the large dishes formerly used being replaced by a permanent ornament, called also *dormant* or *surtout*, consisting as a rule of "a glass stand in a frame of silver and gold." These *surtouts* became more and more important in size and design, till they occupied a great part of the table; and as it was impossible to change them at each repast, and people got tired of seeing always the same piece, it became usual to vary them by floral decoration. This looks as if the origin of *dîner à la Russe* were further back than it is currently supposed to be.

"Statuaries, designers, and painters were also employed to decorate the table, the centre of which was often covered with statues and emblematical groups, with temples, amphitheatres, bridges, and columns made of paste. In some cases the artist would represent a landscape, the ground being covered with snow. A man called Carada invented artificial frost, which melted in the heat of the room, and during that process the guests saw the thawing of the river, the budding of the trees and flowers, as spring succeeded to winter. There were also *Sableurs*, who, by means of coloured sand, designed very ingenious figures upon the tablecloth, some of them representing Persian carpets, powdered marble, ground-glass, bread-crumbs, and other objects, beautifully coloured. Delorme, Pan, and Richard, who were the most celebrated of these *Sableurs*, executed their work with wonderful rapidity, and half an hour sufficed them for the production of these charming designs, which, however, were so fragile that a breath or a drop of water would spoil them."

At what Mansion House dinner, in what City hall, shall we see these artistic ravishments of the dinner-table revived?

Some remarks in regard to the interesting chapters on the theatres and the costumes of the period we must defer.

THE USE OF THE SUPERNATURAL IN ART.

ARCHITECTURAL ASSOCIATION.

At the ordinary fortnightly meeting of this Association, held on the 20th inst., at Conduit-street, Mr. John S. Quilter, president, in the chair, the following new members were elected, viz.:—Messrs. John Adams, Russell E. Scholefield, Albert Cowley, C. Howard Marryatt, John Norton, J. Reginald Naylar, A. Emherst Chancellor, Gustave D. Edmund Grüneberg, and W. J. H. Leverton. Sixteen nominations for membership were read. Mr. E. G. Hayes, one of the honorary secretaries, read the reports of the judges on the drawings submitted in competition for the prizes offered by or through the Association. It is not necessary to devote any space to these reports, seeing that they are only of interest to the competitors themselves, and that the names of the successful competitors were published in our report of the opening *conversazione* of the Association. The president having impressed upon the members, and especially the younger ones, the advisability of not attempting too much in one session, but rather to take up one, or at most two, subjects at a time, and work at them thoroughly,

Mr. Wyke Bayliss, F.S.A., read a long and interesting paper on "The Use of the Supernatural in Art." Mr. Bayliss first proceeded to show that it was the essential nature of art to deal with both the material and the spiritual worlds. Like the great angel of the Apocalypse, art stands with one foot upon the earth, one foot upon the sea, its head encircled with a rainbow, and in its hand a book, in which are words written. Art becomes a record of the human mind, a witness of the evil and the good we have done. Art is more than a record; it is a camera, looking into which we can see the workings of the soul, its aspirations after good and evil, its mighty passions, its agony when hurled back into darkness, its tremulous return to light. Like the tree of life, we stand in the midst of the garden. Around us are the lesser trees, also of the Lord's planting. Their boughs stretch out and mingle with our own, while among them gleam the white garments of the celestial visitants. Thus the world around is for ever reaching up to us, the world above is ever bending over us, but the central theme of art is life,—the life of man,—and the supernatural is only incidental to it. If there is one amongst the myths of Greece and Rome that can touch our hearts, it is because it tells the story of some human life. If with Milton or Dante we stand amidst the hierarchy of heaven, and are not satisfied, it is because this story of human life is missing. If we strike back the hand that would violate the sanctuary of the grave, it is because the dead have lived, and the living have yet to die. If in art we dare to approach the Divine Being, it is only because He was himself pleased to partake with us of this same human life, and in so doing gave us the right to look upon His face. But of all who in art have told this story of life, who does not tell us that it is twofold? If our faith in the spiritual life shall perish, art must perish also. Let the church and the laboratory answer for themselves; but there is no place for the materialist in the studio of the artist, neither can he put his thesis into the poet's verse. There is a passion in art that can be kindled only by the divine flame of love,—a passion that gives to the inanimate world life, that lifts the brute creation to our side, that raises us to God; and this not by confounding things that differ, but by binding the creation into one, and giving it and the glory of it to the Creator. There can be no doubt that the representation of celestial agency is legitimate in art. There is scarcely an artist or a poet who has not made the gods his theme. If the supernatural in art finds its truest expression in our daily life, it is in the rich gardens of religious symbolism that it finds its highest expression. But the moment that art ceases to reflect, and assumes to partake of the divine nature, it dies; arrayed in royal robes, it may be, but it dies; sitting upon the throne, it may be, but it dies. How could it be otherwise? It is impossible at the same time to recognise the true glory of a work of art and to attribute to it a supernatural origin. That which is a representation cannot be also the thing itself. The antique statues which we so highly prize as works of art were made to adorn the temples of gods; but they were not worshipped. It is not in a state of high art that men become idolators. It was just when Greek art culminated in its beautiful statues that Socrates was leading his disciples to think. It was just when Correggio and Da Vinci were filling the world once more with beauty that the Reformation burst forth in Europe. In the days of Phidias men knew very well where their statues came from,—from the studios of their artists. What is of vital moment to the lovers of art is this: that superstition and art cannot exist together. Either art must become so debased that there shall be no glory in it for the artist to inherit, or the people must become so brutish that they cannot recognise a work of genius. Where is the image of the great goddess Diana with the ten breasts, for which Demetrius made silver shrines? Such statues as these are those which men worship. In conclusion, Mr. Bayliss gave a *resumé* of the whole subject of his paper, in which he said: Art, which will touch all things, must lay its hands on Christ too, and nail Him to the cross once more, even though itself should die in the act. For art is a living thing, and can suffer and die, and see corruption, in its miraculous virgins and black Christs as surely as in the great goddess Diana with the ten breasts, or in its Juggernauts and pashts of the still Pagan world. And we have seen also the serener splendour of landscape art, the trees of the Lord which are full of sap, and the cedars of Lebanon which He hath planted,—are they not a living background to the rest? And does not the mighty roar of the waters blend its cadence with the cry that has gone up for our race since first man went forth to his labour? "Seeing the invisible," faith in the unseen world? What is life without it? And Art: can Art so much as exist without it? It is to the poet what light is to the painter, what ideal beauty is to the sculptor; it grows upon us as the stars grow in the evening sky. We see it in the fairy tales told to us when children, that made our hearts beat faster, and our tiny hands clasp our mother's the more closely as at night we climbed the broad stairs to our beds. We see it in the tales of romance and chivalry that we read on summer holidays, beneath the trees by the river's side, or stealthily from books hidden under our *delectus*. We see it in the Christmas carols we have read by our own fireside with the happy faces of our children gathered round us. We turn to our library, and the same thing meets us there. Chaucer and Spenser amongst the earlier writers; Coleridge and Wordsworth, of the Lake school; Keats and Shelley amongst the idealists; Campbell and Scott, who sing of it in ballads; Byron and Moore, whose verses are of love; and Shakspeare, whose name must stand alone, because it comprehends the splendour of them all. Then in our own time are there not Tennyson and Browning, and from the far West Longfellow and Lowell? And from the East come the records of the Crusades, from the sunny South the song of the troubadour, from the North the legends of the Minnesingers. These are not mystics or religionists, but, for the most part, they simply tell the story of human life. But amongst them all there is not one who, in telling this story, does not tell us that this life is twofold. There is no effect without a cause. Why is it that all

men, everywhere, always have seen the same words written upon our life,—in different characters, it may be; blurred it may be, at times, but still the same words? Seeing the invisible; faith in the unseen world. Let theology and science answer for themselves; but it is a matter of life and death to art. If all this life, of which art speaks so passionately, is only the same as that of black Auster, if our prayers are only like the cry of the hunted hare as she feels the dogs upon her, let us have done with all this tremor about the past, this looking for the future. But I am speaking only about art. Well, then, if our faith in the spiritual life shall perish, art shall perish also. What can Materialism do for art? There is a passion in art that can be kindled only by the divine flame of love. But does matter love? There is a passion in art that gives to the inanimate world life, that lifts the brute creation to our side, that raises us to God; and this, not by confounding together things that differ, but by linking into one the whole creation, and giving it and the glory of it to the Creator. With how mighty a flame this passion burns, flashing into light all the strange elements of life, material and spiritual. Again, I say, let the laboratory and the church answer for themselves; but there is no place for the Materialist in the studio of the artist, neither can he put his thesis into the poet's verse. One, indeed, has essayed to do so, but before the pen fell from his hand, the sceptic had become a believer. It is Shelley who wrote,—

"Through wood, and stream, and field, and hill, and ocean,
A quickening life from the earth's heart hath burst,
As it hath ever done, with change and motion,
From the great morning of the world, when first
God dawn'd on chaos."

Who shall say that Shelley wrote this in mockery, or not, rather, that it is the language of one who had seen, dimly it may be, but had seen, the invisible? Said I not rightly that art stands like the great angel of the Apocalypse, with one foot on the earth, one foot on the sea, its head encircled with a rainbow, and in its hand a book, in which are words written?

In the discussion which ensued, Mr. Boyes, in moving a vote of thanks to Mr. Bayliss for his paper, said it was a good thing for them to have placed before them occasionally such a high ideal view of art as that taken by Mr. Bayliss; for architects were only too apt to lose sight of an ideal standard of excellence in the course of the ordinary work of the profession. He thought, however, that it was possible to adopt too high a standard of criticism. With reference to the grotesques of our Mediæval cathedrals, for instance, they were merely the play of the artists, and were useful only in so far as they showed the intense fancy of the artist when unfettered.

Mr. H. H. Statham, in seconding the vote of thanks, said Mr. Bayliss had drawn an inference from the fact that the rise of the Italian school of painters was coincident with the dawn of the Reformation, but he (Mr. Statham) did not think there was any connexion between the Reformation and the Italian Renaissance. He thought that a very interesting paper might be made upon the way in which what we called the supernatural had been attempted to be defined and differentiated in various times and countries. The Greeks did it by getting the finest man or ideal of man. In the Middle Ages the characteristics or attributes of a being represented by a statue or painting were depicted by means of arbitrary signs, such as the nimbus. He agreed with Mr. Bayliss that the art which was worshipped for its own sake was always bad. He considered that much of the ecclesiastical decorative art of the present day was retrogressive in character, and this was seen especially in Mr. Burges's scheme for the decoration of St. Paul's, in which the author proposed to depict a number of saints with their names and symbols under them. The true principle was to let the figures speak for themselves.

Mr. Aston Webb supported the vote of thanks, which was carried by acclamation, and the meeting terminated, after a few words of acknowledgment from Mr. Bayliss.

The next meeting will be held on the 3rd prox., when Mr. W. H. White will describe "How the Parisians build a House in Flats."

Wesleyan Chapel, Hammersmith.—The architect of this building, mentioned in our last, was Mr. Charles Bell.

AUSTRIAN AND FRENCH JOINERS.

Among the various pamphlets published for the purpose of increasing the technical knowledge and the material prosperity of French workmen engaged in the building trades, we note some observations made by M. Thévenet, a joiner from Lyons. He visited Vienna during the time of the Exhibition, and forthwith instituted an elaborate comparison between the house-joiners of Austria and his fellow workmen of Lyons. After examining various window-frames and street-doors, M. Thévenet can find no fault with the Austrian work of hand. The artistic beauty of the carving is further greatly enhanced by the commendable and liberal use of the very best wood, but in many cases the thwart beams or transoms are poised in an inelegant manner. On the other hand the double windows used in Vienna exclude draughts most effectively, and the Austrian awnings are preferable to the French shutters. After inspecting the public monuments of the capital, M. Thévenet still retains the conviction that his countrymen possess better taste, but Austrian wood is cheaper, more easy to work upon, and altogether of a better quality than the wood employed in France for the construction of houses, doors, gates, and windows. Nevertheless, the Austrians surpass in taste most of their neighbours. The Russian window-frames, for instance, are very commonplace, though the handy-work is tolerably good. The Prussian workmen certainly display considerable skill, but are distinguished chiefly for the artistic grouping together of various woods and colours. Norway boasts rather of its wood than its workmanship, and Spain failed to display anything at all calculated to satisfy its national vanity.

With regard to the social condition of the Austrian artisans, M. Thévenet visited several workshops and collected much information. In making these inquiries it became at once evident that the use of machinery in the trade had helped to reduce the hours of labour, which are now fixed at ten per day. The Vienna joiners receive on an average two florins or two and a half per day, and are paid regularly every Saturday. This, it appears, is not always the case in France, and particularly at Lyons, where a number of employers pay the wages but once a fortnight. Piecework in Austria is better remunerated than work by the day, and the necessities of life can be obtained for about the same price. Austrian workmen are well dressed, and rarely indulge in the noisy Monday holiday so prevalent in France. This good result is attributed to the regular weekly payments, which save the workmen from debt on the one hand, and, on the other, prevent extravagance by never allowing them to possess a large sum in hand. At Lyons the joiners only receive on an average 4fr. 50cent. per day; that is to say, 10d. or 1s. less than at Vienna. M. Thévenet calculates, deducting the Sundays, 313 days' work in the year; but, during four winter months, or 100 days, joiners only work eight hours, and this equals a reduction in labour done of twenty days. Adding to this about thirty days lost through illness, want of employment, slack seasons, or the time lost in obtaining new engagements, and there remain but 263 days at ten hours per day. The workmen at Lyons on an average scarcely do more than this in the course of an ordinary year. At 4f. 50c. per day, this amounts to an annual income of 1,180fr. 30c. (47l. 4s. 5d.). M. Thévenet then proceeds to calculate, in all its chief details, the probable expenditure of a family consisting of a joiner, his wife, and two children. Including washing, clothes, and a rent of 8l. per annum, the total sum required is put down at 2,281f. 25c. This leaves a deficit of 1,037f. 75c., and proves, therefore, that to support a small family comfortably the joiners of Lyons ought to earn nearly double the wages they now receive. As the natural result of this inadequate income a great number of skilled artisans are reduced to mendicity, and the offices of the State charities are besieged by solicitations for help from persons who ought to be able to earn sufficient at least to protect them against want.

Of course, it will be understood that these are statements emanating from a workman, and are therefore open to at least some slight suspicion of partiality; but nevertheless M. Thévenet ends well when he insists that the real cure for the evils he exposes is the spread of education. It is the educated and intellectual workmen who produce the best articles, who learn rapidly to alter the character or style of their work according to circumstances, and can be relied upon to do what is wanted, instead of following blindly some old and unsuitable routine.

THREATENED DESTRUCTION OF ST. ANTHOLIN'S STEEPLE, QUEEN VICTORIA-STREET.

On Thursday, the 25th inst., a large deputation of the British Archæological Association waited upon the Ecclesiastical Commissioners, Whitehall-place, to present a memorial on this subject.

Mr. Godwin said he had been asked, as a vice-president of the British Archæological Association, to introduce a deputation from that body, with a view to the preservation of the steeple of St. Antholin's. The Association was founded especially for the protection of ancient monuments, and to that end has laboured with some success throughout the country. It would have been wanting in its duty if it made no endeavour when a fine work by Sir Christopher Wren, an ornament of the City of London, is threatened. When the body of the church was pulled down it was clearly understood abroad that the steeple would be preserved, and it would be something like a fraud if it were now taken down, and would lead the public to be suspicious of any similar promise. The process now going on tends to leave ancient London, full as it is of historic memories, as barren of tangible evidences of the past as a city of to-day in the American wilderness. It is no answer to say that 200 years give this steeple no antiquity: the same observation would have justified the men of the sixteenth century in destroying the monuments of the fourteenth, which we now prize so much. Nor is the money value of the site sufficient reason; or the steeple of Bow Church, which occupies a most valuable frontage, would also be in danger. This old steeple (the speaker continued), in the midst of a new street, is of the utmost value as regards the adornment of the City, and moreover might be utilised either as a public clock-tower, or as forming part of any new building that might be erected on the adjoining vacant site. Surely, however, money is not to override everything in London: the landmarks of history, objects calculated to induce wholesome sentiment, are scarcely to be valued in pounds sterling. We have formulated in the shape of a brief memorial some of the reasons for the preservation of this steeple which should weigh with you, and I will request one of the hon. secs., Mr. Loftus Brock, to read it to you.

Mr. Brock then read the following

MEMORIAL.

The British Archæological Association having for one of its objects the preservation of our national monuments, has learned with considerable regret the intention of the Ecclesiastical Commission to remove the steeple of St. Antholin's Church, Watling-street.

Your memorialists have all respect for the important work of providing spiritual aid for the overgrown districts of the metropolis, and are not disposed to object to this being done with judgment, by the displacement of other endowments where they are not required. No objection was, therefore, expressed either by your memorialists or the public to the removal of the interesting and historical church of St. Antholin, it being then clearly understood that the steeple would be retained.

The preservation of the steeple is urged for the following considerations:—

1. *Its great Beauty.*—It is one of the best works of Sir Christopher Wren, and has been the admiration of many men of taste. It is a great ornament to the City, not only from the new Queen Victoria-street, but also, on account of its height, in the general view of London.

2. *The Smallness of its Site.*—This is but about 44 square yards of the site belonging to the church. Its position does not cause it to obstruct the footways, and its demolition is not necessary for any purpose of public convenience.

3. *The Public Interest taken in its Preservation.*—This is not confined to the parish, and your memorialists may urge the great desire of the parish for the retention, as was evinced by the first scheme, and also by the designs for its restoration. Notwithstanding the second and adverse scheme, your memorialists venture to state that repugnance is felt in the parish against the demolition by many of the parishioners; while of those who voted for the removal, many did so only by reason of the desire to increase the fund for St. Mary Aldermary. The public generally has evinced, and continues to express, anxiety in the fate of the steeple. Its preservation by your instrumentality will be accepted as a public boon; while its removal may seem as a reversal of the wish of the original builders, who aided in its erection for the permanent beauty of the metropolis.

4. *The Possibility of its being Retained with but Little or no Loss to your Fund.*—Your memorialists are aware that a large sum has been offered for the site apart from the steeple, and a much larger sum for the site including that of the steeple after its demolition. We venture to indicate that, to retain the steeple, it could be sold with the site, subject only to a stipulation that it should not be removed.

We believe that were this done, but little, if any, loss would result; for the steeple, which is sound and well built, would give to purchasers a building capable of being readily adapted to many useful purposes, either as a secondary and fireproof staircase above the ground-floor to the buildings to be erected, or as a space for a lift, &c.

The ground-floor is capable of being formed into a capital porch, without injury to the superstructure. The steeple could thus be made a portion of the new buildings, and would appear somewhat similar to such structures as the Coal Exchange, London, where an entrance tower was purposely erected in a similar position. This course is suggested on account of the obstacle which the question of cost raises to its retention as a separate monument.

Your memorialists beg for favourable consideration of these reasons, and can truly state that the preservation of the Steeple of St. Antholin's will be received not merely by the members of the Archæological Association, but by the public, as a graceful concession to public opinion, and no real hindering of your important work.

Several members of the deputation addressed the Commissioners, including Mr. Blashill, Mr. Morgan, Mr. Tucker (Rouge Croix), Dr. Phené, Mr. Matthews, and others.

The difficulty with the Commissioners appeared to be this, that an Order in Council has been made directing that the tower is to be taken down, and the materials and the site sold. It was urged that it might not be difficult to obtain the removal of the words "taken down," so that the steeple might be sold with the site as a whole.

The Commissioners promised consideration.

THE MANUFACTURE OF CEMENT IN THE SALZKAMMERGUT.

Two kinds of cement have been in use from an early time, viz., artificial Portland cement as made in England and Germany, and natural hydraulic lime. A product nearly equal to Portland cement was obtained somewhat later on the northern slopes of the Bavarian and Tyrolese Alps, which is by degrees superseding artificial Portland cement, its manufacture being carried on under especially favourable circumstances, comprising cheap raw material, direct burning, and easy means of transport. In the neighbourhood of Kuffstein, cement is manufactured from extensive beds of marl, belonging to the Lower Tertiary formation, of which some strata show a composition nearly akin to Portland cement. In that locality the marl is obtained from open workings, and brought direct by tramways and shoots to the kilns. The latter resemble iron smelting-furnaces, and are constructed to burn small coal. They have usually a height of from 25 ft. to 30 ft., and a breadth of about 9 ft. Several of them (from 3 ft. to 6 ft.) stand generally in a row, close to each other, and have a common lining-wall. They are served by one stoker, who charges alternately with marl and small coal. The kilns narrow at their basis to about 7 ft., and have a vault in front, through which another workman withdraws the burnt product. This is done by simply shaking the fire bars, which are 3 in. thick, and of which there are five or six. The production per day per kiln is about 400 cwt. The kilns are tapped every half-hour. The firing zone is about in the middle of the kiln. The proportion of small coal to marl is as one to four.

The burnt lime is brought by tramways direct to the cement-mills. These are of different construction, most of them having three stories. On the second-floor is a crushing-mill, consisting of two long fluted steel rollers, which receive the material through a gutter from the third floor, as it comes from the kilns. By this preliminary crushing the lime is reduced to particles of the size of a bean. The crushed material is raised again by lifts to the third story, for better and more uniform separation, and drops through a separator on the runs in the first floor. There are two of them; the ground cement pouring from the millstones direct into barrels placed underneath, where it is shaken into as compact a mass as possible, by means of a lever-like tossing-apparatus. The millstones are imported from Belgium, and are cut out once a week, for the production of Portland cement every second day. In the basement is the turbine, the vertical shaft of which supplies the motion to the millstones; motion is also transmitted by suitable gear up to the second and third floors.

Sometimes the process of manufacture is somewhat more simple. A horizontal shaft, round which three pairs of standing rollers rotate, is set in motion by a turbine. The ground cement drops from the perforated cast-iron roller-trays into a common gutter, is raised by elevators, and arrives at sorting sieves, whence the coarse drops back into the trays, or is ground on runs.

Connected with each manufactory of hydraulic lime is a shop for making the barrels. Its plant consists of a saw for cutting the headings, and a circular saw for the staves, a planing-machine for squaring, and a circular saw for clipping them. The headings are joined out of three pieces before being cut round by the saw. The barrels are bound with hazel hoops.

Hydraulic lime being sold in barrels only increases the expense for packing, which comes to 13 kreuzers = 3d. English, per cwt. The cost of production of the lime, including expenses for packing, is 45 kreuzers (10·8d.) per cwt. if steam power is used, 40 kreuzers (9·6d.) if water power is applied.

The marl from which the hydraulic limè is produced near Ischl is worked in the slope of the neighbouring salt-mine, where it occurs intermixed with bituminous clay, gypsum, and salt veins. It belongs to the Neocomian formation, and contains, according to Patera:—

Deposit insoluble in hydrochloric acid (Al_2O_3,SiO_3)	37·00
Protocarbonate of iron	10·51
Limestone	48·50
Carbonate of magnesia	2·42
	98·43

The marl is burnt in common lime-kilns, the burning is intermittent, the firing wood, and the cost 47 kreuzers (11·3d.) per cwt.

The material obtained is partly used on the spot in the manufacture of the conduit-pipes for bringing the brine from the reservoirs in the mountain to the saltworks. It is mixed in a tossing apparatus with equal parts of washed sand, which has been previously well cleaned in a washing apparatus, the required quantity of water being added. The mixture is poured into the pipe-mould, which is first cleaned in all its parts, and rubbed smooth with dry graphite powder and linen balls before its use. After running in the mass, it is firmly pressed down with a wooden pestle. It takes about twenty-four to twenty-eight hours for perfect setting. The pipes are joined together by cement being poured on to the joints.

It is self-evident that the manufacture of the pipes can only be profitable if it is carried on on a large scale, as is the case at Ischl, where the motor of the sand-washing and tossing apparatus is a water-wheel. With the use of suitable plant, the cost of production of a pipe 3½ feet long is 71 kreuzers (1s. 5d.), or 20 kreuzers (4·8d.) per foot, which bears very favourable comparison with the cost of pipes made of other materials; 4-in. cast-iron pipes costing 2 fl. 25 kr. (4s. 6d.) per foot, cement pipes from other manufactories being 83 kreuzers (1s. 7·9d.) per foot, and wooden pipes 11 kreuzers (2·64d.) per foot; the latter, however, increasing in price in proportion as wood gets scarcer.

The durability of cement pipes in all places where no shifting of the ground takes place is almost illimitable. Cement is in this respect superior to all the other materials mentioned. But it is stated that the durability of hydraulic lime may be still further increased by layers of soluble glass on the insides of the pipes. Two thin coatings of the latter substance are put on with a sponge. This increases the cost per foot by only ¼ kreuzer. Essential conditions for the safe laying down and preservation of the pipes are, however, firm ground and prevention of vibration.

SUBURBAN BUILDINGS.—HACKNEY.

Sir,—In your issue of the 20th inst., there is an article headed as above, referring to several defects in the Metropolis Buildings Act, which have for some time past occupied the attention of sanitary reformers. In common with many others, I consider that an Act of Parliament should be immediately obtained for the metropolis, so as to give the necessary powers to the respective authorities to remedy the defects which are so complained of.

The works referred to in your article which are more immediately under the control of the Hackney Board are those of the new Marsh Sewer and the house-drains. In relation to the new sewer, its fall, adaptation for drainage, its formation, and materials are evidently not fully known to the writer of that article, and I therefore take this opportunity of stating that the invert and side walls of the sewer throughout its entire length have been constructed in a solid bed of Portland cement concrete, 1 ft. in depth at the bottom, and 6 in. backing to the side walls, also that the whole of the arch from Hackney-wick to Homerton-road has been covered with concrete, as well as a portion of the smaller sewer where it passes through a market-garden, but it was not considered necessary to cover the arch in the same manner in other parts of the line, because of its greater depth in the ground and narrower span. The last and longest portion of the work has been constructed not on a very soft bottom, as described in the article, but on a good solid natural bed of gravel.

In order to exhibit the construction and line of the sewer previously to turning the sewage from the old course along the ditch into the new sewer, lights were fixed along the whole line in three separate lengths, showing very clearly the proper form of the sewer. It was then examined by the General Purposes Committee of this Board, and unanimously approved. The sewage was then turned in, when the regular and uniform flow of the stream proved the sufficiency of the fall.

I will conclude this part of my letter by stating that the sewer is of ample depth to admit of the drainage of all existing houses, and also of any houses that may hereafter be erected, without risk of flooding. In confirmation of this opinion I may remark that no houses draining into this sewer have been flooded during the recent heavy rains.

With regard to the remarks about the condition of house-drains, I would suggest that the writer of the article would do some good by stating where the defective drains are to be found, so that proper action may be taken by the Board to remedy the alleged defects.

I cannot understand that defects can exist as alleged, because it has been for many years a custom in this district not to allow the newly-constructed house-drains to be covered over until they have been examined and approved.

James Lovegrove,
Chief Surveyor to the Board.

Town-hall.

*** In respect to Mr. Lovegrove's letter, we have simply to reiterate that our statements are substantially correct. The materials and construction of the new sewer are fully known to the writer, for he paid frequent visits while the first and second contracts were being carried out. Mr. Lovegrove himself, in reply to a question of a member at a recent meeting of the Local Board, acknowledged that there was a change in the bricks, and that concrete backing was only used in places. Portions only of the line of the new sewer run through a bed of gravel, the larger part, as we have stated, passing through a soft and yielding bottom. The defects of the drains are as we pointed out, and, in all matters touched upon, nothing is exaggerated. Next week we may return to the subject with a few short facts which will place our statements beyond dispute.

MR. RUSKIN'S MUSEUM AT SHEFFIELD.

The *Sheffield Independent* says that the house just purchased by Mr. Ruskin for a museum,—the first of his "St. George's schools for the workmen and labourers of England,"—is situated in the Crescent, Walkley. It is now undergoing repairs prior to its being opened to the public. Overlooking the Rivelin Valley, it was doubtless chosen in accordance with Mr. Ruskin's dislike of factory chimney smoke, of which that of Sheffield is by no means a pleasant sample; and also because smoke has been found destructive to fine engravings. It is generally supposed, amongst local lovers of art, that Mr. Ruskin deputed some one to select the building in which the museum is placed; but this is a mistake. He came to Sheffield in his usually quiet and undemonstrative manner, and not only approved of the building now being fitted up, but addressed some twenty-five working men of Sheffield, chatting with them quite familiarly. The interview, which was quite of a private character, took place at the house of Mr. Swann, at Walkley, one of his old friends, and afforded Mr. Ruskin a favourable opportunity of "drawing out" his *protégés*, the working men present, so as to form his own opinion upon the material he had to deal with. He, indeed, is said to have pleased them very much by the remark that he had "come to learn and not to teach"; and altogether the evening's entertainment, for such it is regarded, was much appreciated for its instruction. It is expected that Mr. Ruskin will pay them another visit ere long, when he will superintend the arrangement of the contents of the museum. They will, at all events for the present, be confined to one room, it being an accepted principle with Mr. Ruskin and the St. George's Company that a museum should, above all, be a place of education, and that everything it contains should have for its object the promotion of the highest moral and intellectual culture. "Of

such science, art, and literature as are properly connected with husbandry, St. George primarily acknowledges the art which provides him with a ploughshare, and, if need still be for those more savage instruments, with spear, sword, and armour." This is one of the reasons inducing Mr. Ruskin to place the first of these museums at Sheffield. It is evident that where the best specimens of art are selected the collection, as to its size, will be one of very gradual growth. Some of the first objects to be deposited are some of Turner's engravings, and some prints from Albert Dürer's original plates. These include his "Knight and Death," "St. George on Horseback," "St. George on Foot," "Pilate," and "Caiaphas." Mr. Ruskin supplements the company's gifts by some of his own.

COMPETITION.

COWPEN (BLYTH), NORTHUMBERLAND.

At a recent meeting of the Burial Board of this township the designs of Mr. John Gibson, of Newcastle-upon-Tyne, architect, were selected from the number sent in an open competition for laying out the proposed new cemetery and the erections required therein, consisting of two mortuary chapels, porter's lodge, entrance gateway, fencing, &c. The style adopted is Gothic; the material used in construction being hammered blocking, with chiselled stone dressings. The two chapels are designed on the semi-detached plan, with separate entrances for Churchmen and Nonconformists, a lofty spire rising in a central position between them.

ANOTHER SKATING RINK.

This new mode of exercise has become so much the fashion that every town will soon have its "rink." A fortnight ago a lady friend of ours broke her ankle at a rink, and last Friday another dislocated her arm. But a few casualties of this sort will not stop the game.

London has several such places, and yet, by the board fixed in front of the houses 316 and 317, Oxford-street, near the Oxford-circus, the public are informed that the stable-yard at the rear, formerly occupied by Mr. Wimbush, is now being transformed into a skating-rink, and we learn that 10,000 superficial feet is the area devoted to skaters. There will be a wide gallery round the building.

The whole site is to be covered in with an ornamental roof, having a large lantern-light in the centre, additional light being gained by a clearstory over the galleries.

The front buildings will be altered and adapted to the purposes of a *café* and *restaurant*.

The works are being carried out by Messrs. Green & King, of Old Bond-street, and Mr. Edward L. Paraire is the architect.

DECORATION OF CITIES.

There has been some talk about transforming Portland-place into a so-called Boulevard, and probably nothing will come of it. In Paris they proceed differently as to such matters. The Municipal Committee of the Fine Arts has appointed three members,—M. de Longpérier, of the Institute; M. Guillaume, Director of the École des Beaux-Arts; and M. Duc, architect, to study and organise the embellishment of the promenades and parks of the capital, including not only the Avenue of the Champs Elysées and Buttes-Chaumont, but even the smallest squares. The general features of the project will comprise, it is supposed, a series of busts, giving the features of all the historians, chroniclers, &c., who, like Félibien, Sauval, Dom Lobineau, Lebœuf, Germain Brice, Corrozot, &c., have left studies on the manners and customs of Paris; likewise, statues will be erected of all individuals, mayors of the capital, magistrates, soldiers, &c., of all periods having shed lustre on the city; and, finally, in the larger thoroughfares and parks, groups of statuary will represent all the great historical events which have occurred in Paris from the earliest period to the present day. We should be glad to see a similar step taken in London and some of our large towns.

Manchester Architectural Association.—The first meeting of the newly-formed Manchester Architectural Association was held on Wednesday, the 17th inst., when a committee was appointed to frame regulations.

SOCIETY OF FRENCH ARTISTS.

The eleventh winter exhibition at the rooms in Old Bond-street, which has just been opened, is certainly the most interesting of our winter exhibitions of the year so far; which perhaps was to be expected, though one or two of the recent collections here have not quite kept up the former standard of the gallery. Special interest attaches, now, to the large work by Corot, "The Lake of Némi" (57), painted about ten years ago, and in his finest style; for this, it is to be feared, is the last that will be seen of the large Corots, whose annual appearance made these rooms a sort of shrine for the lovers of ideal and poetic landscape-painting. Since the death of their gifted painter, who came to such a true and noble, though late-earned fame, his most important works have become more and more difficult to procure for exhibitions, having been bought up and dispersed among owners in various countries. There is probably no landscape-painter of recent date (of course we except Turner) whose fame rests on so secure a basis as that of Corot; the very originality of his style and feeling contributed to his long comparative neglect, as his art-language had to be learned before he could find admirers. One or two other smaller things, especially "A Windy Day" (35), are full of the artist's peculiar feeling and poetry in dealing with nature on canvas.

Another landscape-painter in a great style, whose works are also becoming scarcer on this side of the Channel, is Dupré, who fairly startled visitors to this gallery by the tremendous power of his "Southampton Meadows" three or four years ago, but who has never been represented on that scale since. His small works to be found in this gallery from time to time are always, however, marked by a breadth and power of style, and a complete absence of mere "painting" or picture-making, which gives them an interest beyond what their mere scale or subject would claim for them. The catalogue makes a confusion, in the list of artists, between this painter and Dupray; but the signature of the former is unmistakable in the "Environs of Caen" (96). Mdme. Cazin, by whom we have never seen a commonplace painting, has temporarily returned to her native country, and instead of confining herself to painting Sussex farms and villages, sends this year a scene from the French coast, "A Storm" (117), on a larger scale and more ambitious in every way than any work we have previously had from her. The picture is in every sense a very bold one, and the effect of the mass of rolling reddish brown cloud driven almost down on the landscape is so extraordinary as to invite some scepticism on the part of spectators, which we will not however positively say that we share,—we have considerable faith in the statement of a true artist. This work is not so entirely successful as some we have before seen from the same hand, but it is a distinct attempt at grasping a larger class of subject, and may be followed, we hope, by others of still greater power in the same direction. In a smaller work, "Low Tide" (53) Mdme. Cazin is quite at her best; beyond a foreground, formed by a steep road and a cottage, stretches an expanse of sand glittering white in the hot sun, with the boats drawn up, looking like so many black blots on the surface. We should almost have questioned whether the latter were not too strongly delineated for "keeping their place" in the distance; but intensity is at least a fault on the right side in such a subject. Another artist who is naturalising himself with us, M. Lhermitte, sends a small work, "The Cathedral, Morlaix," which all architects who visit the exhibition should look at; as a specimen of entirely truthful and realistic painting of architecture, both in regard to detail, tone, and texture, without hardness and without sacrificing atmospheric effect, we have rarely seen this equalled.

Among other works in landscape may be mentioned Muncaksey's "Fallen Leaves" (115); "The Old Road" (61), by Montbard, a fine solidly-painted picture evidently inspired by the style of Michel; and Bellenger's "Après le Plui le Beau Temps" (36), which is a little heavy in tone, but worth attention nevertheless. The same artist's smaller work, "Thrashing Corn in Brittany" (39), is admirable, both in the action of the figures and the general tone. Roybet's figure, "Le Buveur," scarcely escapes vulgarity, brilliantly painted as it is; nor is it apparent why the drinker should have such a sinister expression of countenance. There is originality and a delicate humour in Dues's little interior, "Visit to a Sculptor" (55), the intrusion of a gaily-dressed conventional lady into the "sanctum" of the *spirituel*-looking artist, who is working at his model; the painting is very bright and effective in the treatment of the accessories of the studio.

The upper room contains a work of some importance by Lhermitte, on a much larger scale than most of his pictures we have noticed lately; "A Pilgrimage" (93), the interior of a church with Pilgrims, chiefly women, in various attitudes of reverence before a shrine. There is pathos in some of the countenances, but the work does not strike us as possessing that individuality and directness of aim which characterise a good many of the artist's smaller productions; is rather a good than a fine picture.

On the screen are to be seen a small collection of Mr. Whistler's studies of figures (chiefly); little sketches in pencil or crayon on rough brown paper, comprising nude studies, and original sketches for portraits which have been executed in oil. These are "caviare to the general," certainly, but to the initiated they have that interest which always attaches to the studies, however slight, of an artist of really an original turn, even though he move in a somewhat eccentric orbit.

THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET, LONDON.

This charitable institution is intended for the reception and medical treatment of poor children, without distinction of race, sex, or creed, whose parents are unable, from poverty, to supply their needs. It is supported by voluntary contributions of the public, and has been already illustrated in our pages.

Her Majesty the Queen is patron of the hospital, and has ever evinced the warmest interest in its welfare. H.R.H. the Princess of Wales and H.R.H. the Princess Christian are vice-patrons. The Princess of Wales recently conferred a special mark of favour on the institution, by consenting to lay the first stone of the new building which is now in course of construction.

The new hospital, a view and plans of which we have already given,* is intended ultimately to provide accommodation for about 200 in-patients. The portion of the building now in progress will contain 109 in-patients.

In addition to the general wards, there are in the new building separate wards for quarantine and whooping-cough patients, with small, separate wards for surgical and separate cases. The plan also provides an operating theatre, a chapel, museum, mortuary, and rooms for the medical and nursing staff, with the necessary domestic offices.

The out-patients' department is extensive and complete, as is very necessary in a hospital for children, because the patients require the presence of grown persons to take charge of them, needing, in consequence, considerable space. This renders necessary special arrangements, to avoid crowding and confusion.

The contracted and costly nature of the site in the midst of London has made it obligatory to economise space as far as possible. The out-patients' rooms are consequently placed in a half-sunk basement-story. There are separate stairs for ingress and egress. A patient awaits his turn in the large waiting-room; he then passes into the consulting-room, where the doctor prescribes for him. He remains in a second and inner waiting-room while the medicine ordered by the doctor is being prepared by the dispensers in the dispensary; and having received his medicine at the dispensary counter, he ultimately leaves the hospital by a route distinct from that of patients entering. The large central dispensary is available for the whole hospital, and small lifts convey the medicines from it to the upper floors. The whole of these arrangements, and the details generally, have been carried out by the architect, in connexion with Dr. West, the well-known physician, who has always devoted himself heartily to the interests of the Children's Hospital. Dr. West's attention, during the progress of the building, has been unceasing and invaluable.

The front portion of the basement floor is occupied by the domestic offices, such as kitchen, scullery, larders, servants' rooms, and heating-apparatus. It also contains a special waiting-room for new patients. In this room a patient coming to the hospital for the first time is seen

* See vol. xxx., pp. 66, 67.

by the medical officer, who decides on the propriety of the case for admission or otherwise. This constitutes a safeguard against the introduction of contagious illness among the patients generally, and gives the opportunity for separation in all such cases. The new patients' waiting-room is, as regards access and egress, completely isolated.

The general wards of the hospital are five in number, and are placed in the upper part of the building, on three floors. This arrangement was prescribed by the peculiarity of the site before adverted to.

The central block is occupied by the staircase, chapel, operating-theatre, and room for administrative purposes.

At the back of the central block the chapel is placed. This is about 26 ft. square, with a semicircular apse, or chancel, and is fitted up in accordance with the custom and ritual of the Established Church of England. The hospital is, however, available for all, without reference to their religious belief. The chapel has been finished and fitted up at considerable expense, at the sole cost of an anonymous donor, as a memorial to a deceased relative.

The architecture of the chapel is of the Byzantine type, and the plan is divided by four marble columns, which has enabled the architect to obtain considerable variety of effect. The central portion is domed, and there are also smaller domes at the four angles. The apse is separated from the body of the chapel by a low screen of alabaster, with panels of brass-work, and brazen gates in the centre. The flooring is of mosaic and coloured marbles, and the reredos is of alabaster. The ceiling and walls are richly decorated, and the windows filled with stained glass by Messrs. Clayton & Bell, the whole of the decorations having reference to the childhood of our Lord, and to child saints, such as St. Timothy.

Each ward is complete in itself, being about 70 ft. long and 23 ft. wide, and 13 ft. high. There are eighteen beds in the ward, and the allowance of cubic space exceeds 1,000 ft. per patient.

There are two minor apartments in connexion with each ward, in addition to special bath-rooms and water-closets. One of these apartments is termed a vestiary, and in it the children's clothes are kept in lockers to secure neatness and order. The other room is used as a ward kitchen. There is here a gas-stove for keeping food hot, and for providing tea, milk, broth, and the various articles of food so much needed by children, without the necessity of sending for them to the ground kitchen. The ward kitchen is provided with a sink for washing China and utensils, a dresser, closets for China and glass, and a safe for provisions.

There is a lift from the basement floor by which the regular meals are transmitted to the ward-kitchens. There is also a shoot for dust. This is in the form of a glazed earthenware pipe, built into the wall, and by it all dust and refuse may be at once removed to a receptacle in the basement, which is cleared from time to time. A coal-lift, available also for the conveyance of patients, is placed in the central block. In connexion with the lifts there are bells and speaking tubes, arranged so as to economise, as much as possible, manual labour in working the hospital.

The hospital is lighted throughout with gas. In the wards and other parts occupied by the patients, care is taken to connect the gaslights with up-cast ventilating flues, so as to remove the products of combustion and assist the general ventilation.

On the upper floor there are five special wards, also separate rooms for quarantine and whooping-cough patients. All these are completely isolated from the rest of the building. The quarantine ward is intended for the reception of doubtful cases, until their nature can be discovered, and their treatment decided upon.

In the construction of the wards, abundance of window space has been thought essential for light, air, cheerfulness, and ventilation. The windows are opposite to each other, and are planned to come between the beds. In order to secure dryness and warmth, the external walls of the wards are built double, with an air space of about 1 in. between the inner and outer walls. The material adopted for the inner surfaces of the wall is glazed brick. Each brick is coated in the manufacture, with a glazed surface of pottery, hard, and quite impervious to moisture. The walls lined with these bricks can, therefore, be washed and thoroughly cleansed at any time, and it is hoped that this mode of construction will secure immunity from pyæmia, and other evils sometimes incidental to hospitals. The glazed surfaces of the bricks are made of different colours, such as red, brown, and light-green, and are disposed ornamentally, so as to give the walls a pleasing and bright appearance. The floors are of concrete, by Messrs. Dennett, supported by iron beams and joists. The construction is therefore incombustible, and forms an effectual separation of the stories. The upper surface of the floors in the wards is covered with teak 2 in. thick. This wood was selected as the hardest and most impervious to moisture available, and a wooden floor was considered more healthy and comfortable for the patients than any other material. The water-closets, bath-room, and ward kitchens are floored with hard asphalte, laid on the concrete, to admit of constant washing and cleansing.

The wards are warmed by means of stoves placed in the centre of the room. The stove has two faces with visible grates so as to secure the cheerfulness of an open fire. The smoke passes away by a descending flue, which is constructed in the thickness of the floor. Fresh air is admitted to the wards from the external atmosphere by a similar flue. The air passes through warming-chambers in the stove, which can be regulated so that it may enter the wards in winter heated to any temperature that may be desired.

The smoke-flues from the stoves are carried into a general shaft, and are formed of iron pipes. These pipes becoming heated by the smoke, cause an upward draught in the shaft. Advantage is taken of this circumstance, and the shaft is connected by separate inlets with the ceilings of the wards so as to draw off the vitiated air from them. In summer time, when the stoves are not in use, the up-cast draught in the shaft can be assisted if necessary by a small furnace in the basement, specially constructed for this purpose, and placed in the bottom of the shaft. Hot-water pipes are also placed at the ends of the wards, as an auxiliary means of warming them in severe weather.

The operating-theatre is at the back of the central block, over the chapel, and is about 25 ft. square. It is on the upper floor, and in easy communication with the separate wards. It is lighted by a skylight as well as by windows, and is fitted with raised seats for the use of students.

The water-closets, baths, and other necessary accommodation, are placed in the angle towers of the building. Each tower is used as a ventilating shaft for these adjuncts. Openings are contrived at the tops of the pyramidal roofs, and a coil of hot-water pipes is placed in each roof, to assist the upward draught. Flues for the discharge of vitiated air, communicate with the several floors beneath, which are thus entirely cut off from the rest of the building.

The mortuary is to be constructed outside the building, and cut off from all direct connexion with it. Attached to the mortuary will be a room for post-mortem dissections, a microscope-room, and also a museum for anatomical preparations.

The drainage of the hospital is effected by glazed earthenware pipes. The drains are carried round the exterior of the building, and communicate with the main sewer by means of a specially designed iron-pipe connexion. Precautions have been taken against the risk of a rush of bad air from the main sewer. The iron connecting pipe is furnished with two traps, one at each end of it. From the intervening space between the two traps there is an up-cast air-flue, which is carried up to the top of the building. If at any time there should be a draught from the sewer strong enough to force the first trap, it would be intercepted and carried off innocuously by the air-flue, and the protective operation of the second trap would not be affected. All the drain-pipes from the closets, &c., are ventilated, and all waste-pipes from cisterns, &c., have separate outlets, and are cut off from the main drains.

The high roofs of the building are utilised for the sleeping-apartments of the nurses and servants. There are no nurses' rooms in communication with the wards, as is often the case with hospitals for adults. In children's wards, nurses, when present, are always on duty, while they take their meals in a common room, and sleep away from the wards.

The building is heated throughout by hot-water pipes, in addition to open fireplaces in most of the rooms. The water in the pipes is heated by steam from two steam boilers placed in the basement. Hot water is also supplied from the apparatus to the baths, sinks, and lavatories throughout the building.

The kitchen is fitted with a cooking apparatus by Messrs. Benham, and contrived on a principle used by the Government in barracks, workhouses, and other large establishments. From a single fire the operations of boiling, roasting, steaming, and so forth, can be carried on at the same time, it is stated, with great economy of heat and fuel.

For the exterior of the building bricks are used. They are of two colours, red and yellow, and are moulded so as to present the architectural forms called for by the design. The roofs are covered with boarding, felt, and red tiles. The balconies, which form a prominent feature in the elevation, are not for ornament alone. They are designed to protect the external surface of the walls from sun, rain, and snow, and are also available for the exercise and recreation of the children. The turret-like chimneys are used for smoke-flues, vitiated air-shafts, and lifts, and the object of the architect, Mr. Edward M. Barry, R.A., has been to introduce no feature in the design which was not warranted by the purpose of the building, namely, the medical treatment and restoration to health of the sick and suffering children of the poor.

Messrs. Perry are the contractors for the building, and Messrs. Benham for the heating arrangements. Mr. House is the clerk of works. The hospital is now open for the reception of patients, and appeals earnestly for assistance in its beneficent work.

ON THE DECORATION OF BASILICAS AND BYZANTINE CHURCHES.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.*

Resuming our notice of Mr. Pullan's paper,—the reader said the cathedral of Monreale is transeptal in plan. The columns and wall-linings are of a grey streaked marble resembling cipolino. Rich strips of mosaic divide the marble slabs of the wall-linings into panels, and separate them from the pictures on the walls. Bands of floriated ornament run round the arches and divide the pictures on the walls of the nave. The subjects of these pictures are from Old Testament history up to the time of Jacob. Those in the aisles and transept from the New Testament. Above all there is a rich frieze of medallions filled with half-length figures of angels. In the central apse there is a colossal figure of our Lord, with four majestic archangels at the sides. On the side walls of the chancel there are two rows of figures, apostles above and bishops below. The whole is crowned by an open roof resplendent with rich diapers. The prevailing colours of these mosaics are dark blue, light green, dark red, and brown, all heightened with white on a gold ground. In the cathedral of Messina the roof is even richer in colour than that of Monreale. The other decorations have disappeared, with the exception of the colossal figure of the apse. The system of decoration adopted in the Basilican and Byzantine churches was somewhat similar. Ornamental pavement was ever a conspicuous feature in the ancient basilica. This is evident from the name Gabbatha—the pavement—given to the apse of the basilica in Pilate's house, in which our Lord was condemned. *Opus Alexandrinum* was almost universally employed both in the Christian basilica and Byzantine church. It afforded a dark rich body of colour, as it was composed of circles and other figures of porphyry or serpentine, surrounded by inlays of similar marble, together with a dove-coloured marble called *palombara*. Of this description are the pavements of SS. Giovanni and Paolo, Sta. Croce in Gerusalemme, and that of San Lorenzo. Mr. Pullan found, upon making inquiry of the master-workman who restored the pavement of Sta. Maria in Trastevere, that this sort of pavement is at present very expensive, chiefly on account of the difficulty of procuring the *palombara*, which can only be obtained from the excavation of ancient buildings, as there is no quarry of it open, and the small quantity used would not repay the search for a quarry. On account of its great cost, therefore, they are generally content with an imitation of it, and the best imitation is by the use of the mosaic called Veneziano, which is formed with small pieces of rich marble placed in patterns in a hard cement, and then ground down and polished. Mr. Pullan had employed this in a church at Baveno, and he thought that

* See p. 1033, *ante*.

with some modification it might be used for wall-lining, in cases where the great cost of large slabs of marble could not be incurred. The walls were lined to a certain height with slabs of marble, with moulded cornice and string course, forming a dado, either plain, as in St. Mark's; in panels, separated by mosaics, as at Monreale; or divided by stiles of a lighter colour and enriched mouldings, as at Aghia Neamone. These wall-linings were generally simple veneers. The practice of veneering was common in Roman times. When excavating the year before last in a vineyard adjoining the Baths of Caracalla, Mr. Pullan came upon a water conduit in which there were many fragments of Africano and Giallo antico, varying from one-eighth to an inch in thickness;—pieces of the veneer with which the whole surface of the bath had been covered. Of this description were the wall-linings of churches. Objection had been made to the use of veneers in modern work, but surely it was carrying our natural abhorrence of shams too far to refuse to make use of veneers because we could not afford to use marble in blocks. This objection was as puerile as the declining to hide the face of honest but ugly red brick with a coat of plaster. He thought it perfectly justifiable to use either veneer of marble, variegated scagliola, or coloured stucco for the purpose of obtaining colour, in cases where funds did not allow of the purchase of blocks of marble. Stucco is used with considerable effect in the church of St. Vincent de Paul, and other churches in Paris. There would be less sham in these methods of decoration than in the imitation of marble used by Giotto at Padua and Assisi, and by other Mediæval artists and architects, upon whose practice the opponents of so-called shams profess to base their principles. Above the dado there were mosaic pictures, as at Monreale and the Capella Reale; frescoes, as at San Clemente; or inlaid patterns, as at St. Demetrius, Salonica. It is most probable that frescoes were generally used in both nave and aisles, and that in the restoration which almost every basilica has undergone they have disappeared, while the mosaics of the apse have been preserved. The soffits of the nave arches in the basilicas were enriched with coffers, as at St. Apollinare il Nuovo; in the Byzantine churches with rich interlacing patterns, as at Monreale and St. Mark's. The roofs were either open, the timbers being covered with elaborate diapers, or they were flat ceilings, adorned with coffers and painted panels. It cannot be positively asserted that a single example of the original flat ceiling exists either at Rome or Ravenna. The apse, the chief feature of the basilica, is preserved intact in many churches at Rome and Ravenna. The conch was invariably covered with mosaics. At Rome, we have those of St. Pudentiana, probably of the fourth century; SS. Cosmo and Damian, of the sixth; St. Agnes, of the seventh; SS. Nereo and Achilleo, of the eighth; St. Prassede and Sta. Cecilia, of the ninth; St. Maria, in Trastevere, and San Clemente, of the tenth and eleventh; and Sta. Maria Maggiore and San Giovanni Laterano, of the thirteenth century. In general there is a figure of our Lord (replaced in later times by the Virgin and Child), attended by the Saint to whom the church is dedicated, in the centre of the apse. We do not see the colossal Majesty except in Byzantine churches and basilicas of a late date, as at Pisa, Messina, and Trieste. The finest and earliest apse is that of St. Pudentiana. It is often attributed to the time of Adrian III., A.D. 884, but the strictly classical togas, and the character of the houses in the background, which closely resemble those in the sculpture of the fifth century, afford sufficient evidence that the mosaic is of that period, though probably restored in the sixteenth century. After the apse, the Triumphal Arch, so called, because on it was represented the Triumph of our Lord, was most conspicuous in the basilica. The subjects on it were of Apocalyptic character. The best examples remaining are those of Sta. Prassede, St. Paul's without the walls, and St. Lorenzo. In the Byzantine church the central dome absorbed the artist's highest powers. The subjects depicted on it are various, at least in early times. Later, when fresco superseded mosaic, the iconographic arrangement throughout the whole edifice became fixed by rules, which are to be found in the "Manual of the Painter," discovered at Mount Athos by M. Didron, and translated by his companion, M. Durand. Although written in the fifteenth or sixteenth century, this book contains a collection of formulas and receipts which had been handed down by tradition from the painters of the tenth and eleventh centuries. In consequence of the observance of these precepts, the Byzantine decorations became of such a stereotyped character that it is now very difficult to decide upon the date of any Greek painting, either from its forms or colours. We find the same saints at Venice, Mount Athos, and Megaspelion, whether of the tenth or fourteenth centuries. On account of the vicissitudes which churches in the East have undergone, it is difficult to trace the progress of church decoration there. As early as the twelfth century, mosaic gave place to fresco in the churches of Trebizonde, while in Italy it was revived by a school of Greek artists, and flourished there until the thirteenth century, being employed by them in the baptistery of Florence, the Lateran, and Sta. Maria Maggiore. The Arabs were quick to perceive the beauties of mosaic, and they employed it in the decoration of the Mosque of Omar at Jerusalem, a building very rich in colour. The few Byzantine churches which existed in Asia Minor were converted into mosques, and the mosaics either whitewashed or destroyed; but in Turkey in Europe, and Greece proper, there are still many monasteries and churches which retain their original polychrome; such as those of Daphne and Megaspelion. Although mosaic, as a means of decoration on a large scale, was superseded by fresco at the period mentioned, it was retained by the Cosmatis and others for the decoration of furniture, particularly the ambones and baldachini of the Roman churches. Even in the works of Giotto and his school we see a lingering love of it in the imitation of it in the borders which separate their pictures. The term "basilica" has been frequently applied to churches of large dimensions, built on a basilican plan in any style, and to churches that have been rebuilt on the sites of ancient basilicas,—in which sense Santa Croce at Florence and St. Paul's of London may be included under their denomination. A few buildings of the former class, which exist in Northern Italy, deserve note as affording good models of decoration: these are San Maurizio at Milan, painted by Borgognone and Luini; the church at Serrano by Gaudenzio Ferrari and Luini, and St. Andrea at Vercelli by Ferrari. In all of these the decoration (chiefly consisting of figures) is of that refined and quiet style which prevailed before the style adopted by Michelangelo became general, and which is so suitable for imitation in the decoration of our Renaissance churches; for it is to be hoped that before long many of the dismal-looking churches erected in London during the last two centuries may be enlivened by polychrome. There is no city church, however ugly, that cannot be made beautiful by proper colouring. If gloomy, it may be illumined; if low, heightened in effect; if too lofty, lowered; even the necessary gallery fronts might be made ornamental, though this is perhaps a questionable advantage. In such buildings as these the severe mosaics of San Vitale would be out of place, but the frescoes of Luini and his contemporaries would be very suitable. In concluding, Mr. Pullan described briefly the manner in which he has attempted to revive Byzantine decoration in what may be called a semi-Byzantine Church at Baveno. As he perceived that in all the earlier buildings bright positive colours were employed almost exclusively, and that tone or brilliancy was imparted to them by the use of lines of white or black, he adopted this practice as the principle of the colouring throughout. The walls are grounded with yellow ochre, upon which there are foliated patterns in reddish brown. Bands of a bluish hue, relieved by pateræ, divide the foliage at regular intervals. Borders of foliage on blue and green grounds run round the windows and doors. The tympana of the doors are filled with mosaics by Dr. Salviati, on gold grounds. The soffits of the arches are of geometrical patterns, in blue and green. The roofs are painted with arabesques in strong brown lines, with bright foliage, on the natural ground of the wood, which is Baltic timber, oiled and varnished. The columns are of granite; the pavement of Veneziano; the windows filled with stained glass by Clayton & Bell; and the pulpit, dado, and steps of rosso di Levanto, Porta venere, and grey Carrara marble; so that there is no part of the church without colour. This universal prevalence of colour was common to the Byzantine churches, of which the building at Baveno is an imitation, though, on account of the substitution of tempera for mosaic, it is vastly inferior to them in effect.

"INDIA."

We have already mentioned the beauty of the Book on "India," by M. Rousselet, revised and issued in England, and which appears at a moment when the people of this country are feeling more interest than usual in the East.* It has a value, however, far beyond what a passing incident may give to it. The author has presented to the reader, as the preface correctly states, the result of a six years' study of the architectural monuments, religious beliefs and symbols dating back to earliest history, works of art, systems of civilisation, and progress, in an easy style calculated to fix the attention of the lightest as well as the more serious reader. The circumstance of the traveller having but very slight national connexion with the country explored is of itself an advantage, as he brings a fresh mind and independent ideas to bear upon the subject, free from any preconceived bias or prejudice. He describes his impressions exactly as he experienced them, and we cannot wonder that his prevailing sentiment was one of enthusiastic admiration of what he saw. "The title of the work indicates the chief object of the author. He was comparatively indifferent to the India of railways, hotels, and telegraphs. He was bent on visiting the courts and countries ruled by native princes, great and small, of all ranks and all creeds, and to see for himself what are the modes of life and conditions of civilisation among the stately chieftains of native India. With this view he visited the kingdoms of the principal Mahrattah and Mahommedan sovereigns,—Scindia, Holkar, the Guicowar, the late Queen of Bhopal, and of the Nizam, and has graphically recorded his experiences, while some of his most vivid descriptions are devoted to the romantic history and achievements of the ancestors of the Rajahs of Central India." He makes his reader acquainted with the heroic traditions as well as the daily lives of the representatives of those ancient Rajpoot houses at the present day.

Various and many have been the efforts of European travellers and artists to create, in Europe, an appreciation of those works, at once mighty and beautiful, "designed by Titans, and wrought by jewellers," which the Moguls bequeathed, after their long, though unhappy reign, over the principal parts of India. The Prince of Wales will not, it is true, see these alone; he has visited, amid a fictitious firework blazonry, utterly unbecoming to the thought and spirit of the scene, the Caves of Elephanta, and those solemn temples of the South, wherein, if Art ever expressed Religion, it was deified, however grotesquely. But the monuments most open to his view must be the trophies of the Mohammedan architects in the north-west, along the banks of the Ganges, and in the great interior, made splendid by "the magnificent son of Akbar." There is a too common tendency in Europe to represent India as a country of gauze and gold; of palanquins and bearers; of equipage, jewelry, and glitter. But the Arabian conquerors, ruthless though they were, planted monuments in that soil, which are perfect beyond the power of imitation; and their works are not less imperishable in the history of art than are those of the Abencerrages in Spain. It is not for us, of course, to adopt this style; we can be no more Saracenic in architecture than we can be Saracenic in manners; but the comprehension of either signifies not a little; and it is utterly futile, in these days, to fall back upon Doric, Corinthian, and Ionian types, as the only possible forms of strength and beauty. The new lesson is to be learned in India. No doubt, it ought to have been taught long ago, though the teaching might have been of slender use, except to the purely intellectual mind of the West. Climate governs architecture all over the world, whether the edifice be a Tartar tent or a Buddhist temple; and yet, while we cannot hope, or wish, for instructions from the dim Indian south, or the more joyous and splendid north-west, already made familiar in the photographic galleries at Kensington, we may look to a more special interest in them, after they have been illustrated by a visit from the Prince of Wales. Concerning few buildings on this earth has so much been heard as of the tomb which contains the dust and ashes of Shah Jehan and his wife. Colonel Sleeman confesses that, for five-and-twenty years of his life, he had looked forward

* "India and its Native Princes. Travels in Central India, and in the Presidencies of Bombay and Bengal." By Louis Rousselet. Carefully Revised and Edited by Lieut.-Col. Buckle. Containing 317 Illustrations and six Maps. London: Chapman & Hall, 193, Piccadilly. 1876.

to a glimpse of that unequalled mausoleum. When seen, it surpassed his every expectation; it went, indeed, beyond his fancy,—from the gateway to the dome, from the dome to the minaret, all appeared perfect to his eye; the Taj Mahal, indeed, satisfied the mind of a critical man who had been longing, through a period of twenty-five years, to see it, "from the first *coup d'œil* of the dome in the distance, to the minute inspection of the last flower upon the screen round the tomb." It was what, in his memory, he said, he should never cease to see, and yet what he could never describe. That sculptured vault; those inscribed slabs of marble; the mosaic flowers embroidering the walls; that tomb, costing three millions sterling, and more; what must have been its effect upon the Asiatic imagination? Colonel Sleeman asked his wife this question, and she answered,—"I cannot tell you what I think; but I can tell you what I feel: I would die to-morrow to have such another over me!" The edifice, though foreign ideas are blended in it, is a perfect example of Mogul architecture. It stands on the north side of a large quadrangle, looking down into the clear blue stream of the river Jumna, while the other three sides are enclosed within a lofty wall of red sandstone. The entrance is through a magnificent gateway, between two beautiful mosques, corresponding exactly with each other in design, proportion, and execution. The vacant area is laid out in square parterres, planted with flowers, shrubs, and cypress; the pathways are paved with slabs of freestone; the gardens cooled by intermittent fountains.

We are enabled, by the courtesy of Messrs. Chapman & Hall, to reproduce the view of the gateway given in Mr. Rousselet's book.

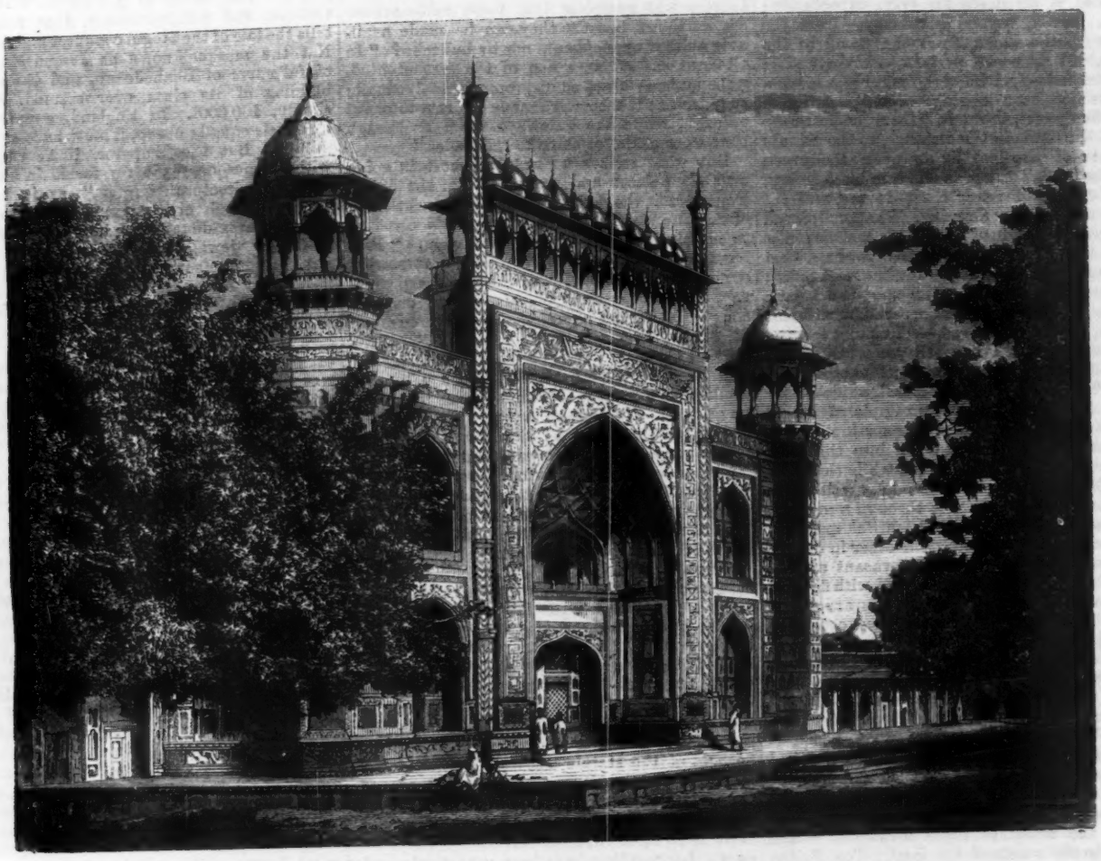
But the mausoleum itself is the pride of the whole place, with the terrace upon which it stands, the minarets of white marble, inlaid with precious stones, the cupolas and columns around, and the pavements polished to the smoothness of ivory. We must not, however, concede the credit of these wonderful works entirely to the artists of the East. The Prince of England will meet more of the genius of Europe than that of Asia in these Oriental cities. The superb structures which make of Agra and Delhi shrines for the artist are due to the genius of a Frenchman, Austin de Bordeaux, who built the Mausoleum and Palace of Delhi, the Mausoleum and Palace at Agra, and was modelling the silver ceilings for both when a jealous contractor poisoned him. They could not, however, take away from his fame the incomparable fret works of the Pearl Mosque, erected at the cost of Shah Jehan; possibly the most exquisite structure in the whole Indian region. It is built entirely of white marble, without a bit of mosaic upon pillar or panel, richly flowered in relief, yet pure, simple, and majestic throughout. The sumptuously-coloured tomb of Akbar, in red, blue, and green, though more splendid in its reflection of that kaleidoscopic climate, is far less imposing, exteriorly, though the interior is as one vast gem, and one which, unhappily, successive generations seem bent upon desecrating and destroying. It is thus with the tomb of Akbar himself, at Secundra, reared over his remains by his son, the Emperor Jehangeer. His body lies deposited in a deep vault under the centre, and is covered by a plain slab of marble, without fretwork or mosaic. On the top of the building, which is three or four stories high, is another marble slab, corresponding with the one in the vault below. This is beautifully carved, with the ninety-nine names, or attributes, of the Deity, from the Koran; but, within, there is no mortal splendour that can be compared with it. One truth, however, always occurs to the European mind. The Mogul emperors, when they took up a residence at any particular place, always covered the neighbouring hills with luxurious and handsome buildings. Thus, at Secree, which the Prince will visit, is the mausoleum of a famous saint, the very porchway of which would eclipse in grandeur any similar structure, or a thousand similar structures, in Christendom. The quadrangle containing the mosque on the west side, and the grave of the old hermit in the centre, was completed in the year 1578, six years before his death, and is, perhaps, one of the finest in the world. It is 575 ft. square, and surrounded by cloisters of imposing height and space. The gate-entrance surmounts a flight of steps, 24 ft. high, and is, itself, of five times that altitude, being the same in breadth, and presenting beyond the wall five sides of an octagon, of which the front face is 80 ft. wide. In presence of this grandeur, can we have patience with those utilitarian Anglo-Indians who complain that these noble arches are worthless, because they can be made available neither by elephants nor by bullocks? "In all these cases," says one of the discontented, "the staircases are as disproportionately small; they look as if they were made for rats to crawl through, while the gateways seem as though they were made for ships to sail under."

But what strikes a European most in going over the palaces and monuments of the Mogul Emperors is the deficiency of what a gentleman of fortune, in his own country, would consider as merely comfortable accommodation. "Five hundred pounds a year," writes a somewhat cynical Anglo-Indian, "would, at the present day, secure him more of this, in any civilised country of Europe or America, than the greatest of those Emperors could command." Still, they have left their monuments, and the present and future centuries, which will never produce the equals of them, are bound to be grateful. They have a noble quadrangular garden at Deeg, one of the Prince's halting-places, encircled by an ornamental parapet. In the centre of each of the four faces is an exquisite pavilion, built of a peculiar sandstone, brought from a distance of about fifty miles. The flags, representing the natural strata, are about 16 ft. long, 3 ft. wide, and 1 ft. thick, and, without any use of the chisel, smooth as glass. With such materials at hand, a beautiful pavement shone beneath the feet of the wayfarer. And yet the modern aspect of these cities, brilliant though their monuments are, is saddening. Delhi is a ruin, Agra only the *succursale* of its renowned Taj, Benares a beautiful fragment, and they are preserved as wonders of the world, by the works of the Moguls alone. Thus, old Delhi is still a place of art pilgrimage, on account of the stately Khootub Meener, and its Palace of Deewan Khan, built without cement, the former, however, being the one cynosure of its kind in the peninsula. Strangely enough, there is no other tower in this Indian Empire of ours. Large pillars have been cut out of single stones, to commemorate the conquests of Hindu princes, whose names no one was able to discover for several centuries; but they are rather evidences of mechanical skill than of artistic genius; while the Meener, grand in outline, chaste in embellishment, exquisite in finish, suggests not a critical thought. It is not very lofty,—only 242 ft., tapering from a circumference of 106 ft. It is circular, and fluted vertically into twenty-seven semicircular and angular divisions. There are four balconies, supported upon large stone brackets, and surrounded by battlements of richly-sculptured stone, the whole having been originally white, though reddened now by the action of the atmosphere upon a ferruginous material. Archæologists have attributed this structure to the Hindus; yet it abounds in inscriptions from the Koran, and we know that the Mohammedans, except in the exultation of their triumph over St. Sophia, rarely adopted the temples of a hostile religion. Besides, the inscriptions are all in bold relief, which disposes of the question peremptorily. All these edifices, however, are slowly, but surely, subsiding into decay, and the pretence of restoration now exhibited is no more than a revival of the fitful fancies which were prevalent a few years ago. In what condition is the slab of Mouzzim, the son and successor of Aurungzebe, the greatest among the crowned descendants of Akbar? It is mutilated, and covered with grass. The domes of the tomb of Altmush have fallen in, and heaped the interior with fractured masses of white marble. That of the celebrated Imaum Mushudee, Akbar's religious counsellor and friend, was converted into a dwelling-house by an English civilian, who removed the sacred slab to make room for his billiard-table,—an insult to the people which they avenged by an assassination. The traveller can pass nowhere through this land of monumental magnificence without being reminded of that pride and that imagination which have left so many illustrations of themselves in Spain. The Prince will see, of course, the extraordinary tomb of Nizamoodeen, which Bishop Heber compared to a pile of potted meat, so grotesquely varied are the tints of its architecture; but, in addition to these grander memorials, there may be seen hundreds of lonely minarets, seemingly fragile, yet wearing the complexion of age, pretty white domes, better adapted, one thinks, to be pavilions of pleasure than the shelters of graves, and a thousand other substantial reminiscences of a power, a glory, and a wealth long vanished from the land. It is the mausoleum of Humayun, with all its vastness and sumptuousness, that most truly tells the tale of the Mogul conquest and dominion. Not the mosque known as Jumna Musjid, the *chef d'œuvre* of Shah Jehan, and the cheapest building of its class ever erected. It cost, simply, 100,000*l*. In England, supposing the materials equally cheap, it must have cost half a million. But the Emperor, if he economised with his mosque, made up for it in his palace, "the architectural garden," as it has been termed, though civilisation has whitewashed its pink colours, dilapidated its throne, shattered its lovely jewelled mosaics, for the sake of plunder, and left it a scene of picturesque desolation.

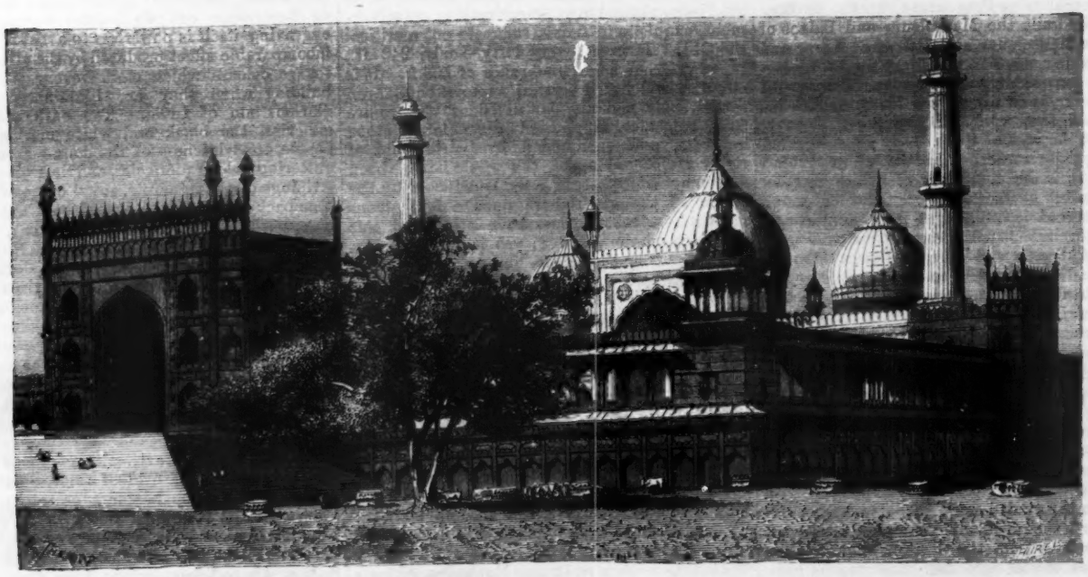
M. Rousselet illustrates and describes this remarkable structure, and we are enabled to give one of the smaller views of it. "After taking possession," he says, "of the room which was allotted to us by the rules at the rate of one rupee per day, I left the bungalow, and, accompanied by Schaumburg, proceeded towards the mosque, the sacred Jumna Musjid, one of the monuments which the Mussulmans of Central Asia and of India most venerate and admire. This edifice, entirely composed of red sandstone, is raised upon an immense terrace, to the summit of which three magnificent pyramidal staircases lead, each terminating in a monumental doorway. We then found ourselves in a fine marble-paved court, surrounded with cloisters of singular lightness and elegance, and ornamented in the centre with a fountain of a winding shape, designed for the ablutions of the faithful. At the end of this court, the broad façade of the mosque extends. It is composed of a long row of low narrow arches, on each side of a lofty doorway, in the form of a pointed-arched niche; and three white marble domes, with black mouldings, much too large in proportion to the moderate height of the façades, crown the edifice, which is flanked by two superb minarets, striped longitudinally with white and pink, and elevating a delicate cupola of white marble in the air to a great height. The whole effect is grand and imposing; and, notwithstanding some defects, we may agree with Fergusson that the great mosque of Delhi is the masterpiece of Indo-Mussulman religious architecture: but what no description can do justice to,—and even engraving itself is powerless to assist it,—is the incomparable effect produced by the vivid though severe colours which clothe every part of the building when they are illuminated by the glorious sun of India. The dark red of the galleries, the black and white marble of the façade, the whiteness of the domes crowned by glittering golden pinnacles, and the rose-coloured stripings of the minarets, stand out against the blue background of the sky without any crudeness, but rather with a severe harmony, proving the care with which the architect had combined and matched the varied shades, and skilfully calculated their effects, according to the different parts of the edifice they were connected with."

The interior of the mosque is very simple. Its roof, pillars, and pavement, of white marble, are embroidered with delicate arabesques carved in the stone; and on the walls slabs of black marble bear short inscriptions in praise of God, and in memory of Shah Jehan, the founder of the mosque.

At the southern extremity of the Plain of Delhi,—an immense field of ruins,—stands the remarkable triumphal column, or, rather, tower, known as the Kootub. We give a view of the fine gateway in the inclosure. "Alla-deen's Gate" (as it is called), "erected by the Sultan Ala-ood-deen, might have inspired the celebrated author of the Wonderful Lamp; the genie of the Roc could have created nothing more fairy-like. The work of the Moors of Spain in the Alhambra of Granada is not to be compared to this perfect gem of architecture. Here it is the stone itself, a red sandstone relieved by stripes of white marble, which gives the colouring; and the delicate arabesques which cover it on all its sides are carved and inlaid; while, at Granada, the whole effect is obtained by a combination of bright colours and gildings, simply spread on ordinary brickwork. Moreover, there is no part of the Moorish Alhambra in which we can find the same purity of outline, and grandeur of proportions, that characterise in so high a degree the Gate of Alladeen." It forms a sort of square pavilion, perforated on each of its four sides by an indentated arch, and surmounted by a beautiful cupola; and the inner hall is as richly decorated as the façades. Having passed through this gate, visitors find themselves



PRINCIPAL ENTRANCE OF THE TAJ GARDENS, AT AGRA.

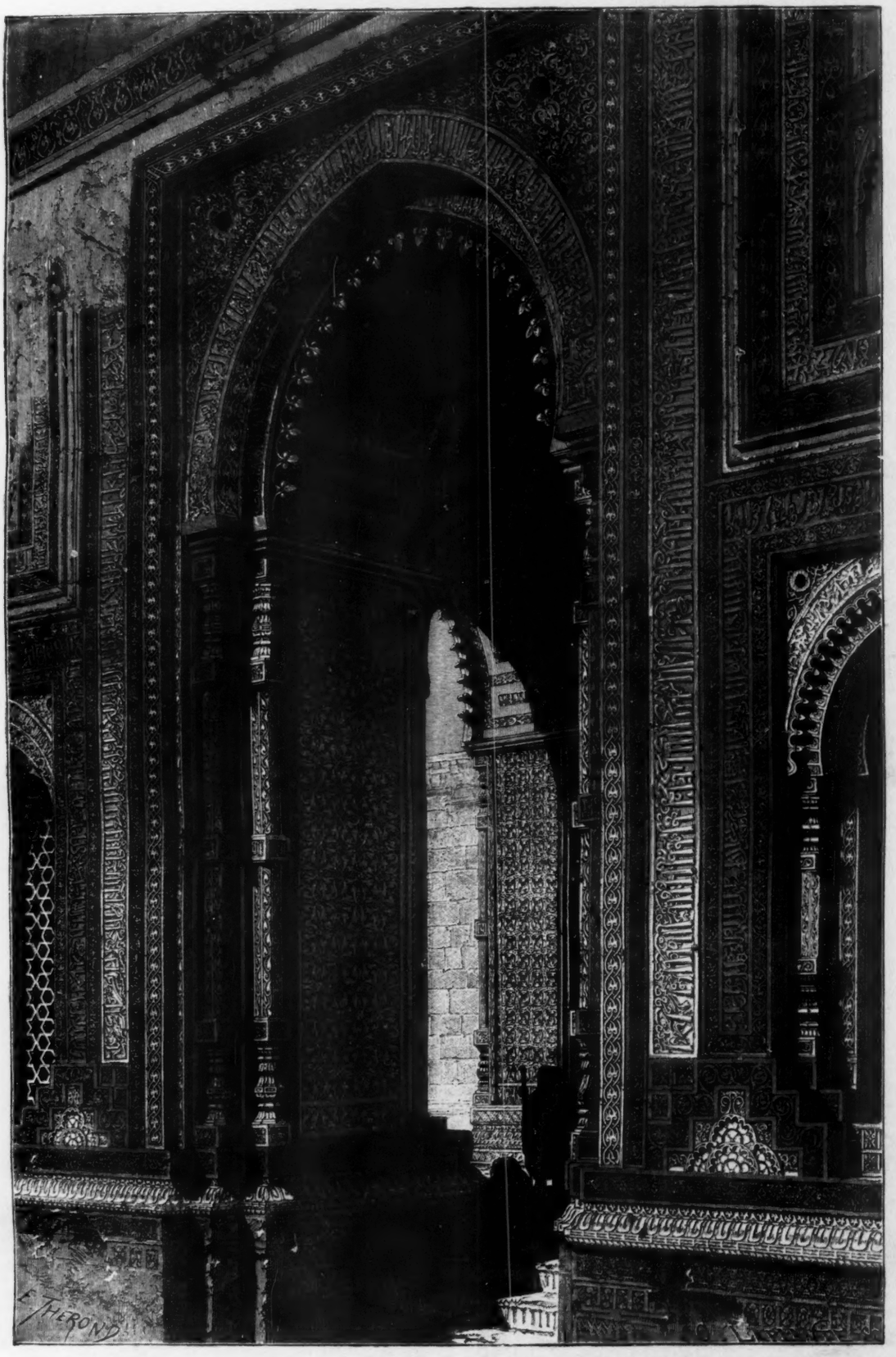


THE JUMNA MUSJID.

almost suddenly at the foot of the Kootub, which stands alone and isolated in the centre of a paved court, proudly raising its head at a height of 227 English feet.

The contrast between these gaudy exotics of Indian art, and the massive, solemn, almost sepulchral grandeur of such shrines, for example, as those of Vijayanagar, representing an enormous opulence and power;—terraces a thousand yards in length, of Babylonian solidity; gates surmounted by ponderous pyramids; idols rivalling in magnitude those of antique Egypt; staircases broad as a public street; temples crowded in hundreds, and each sufficiently superb to satisfy a modern town; infinite richness of sculpture; but no colouring whatever,—no polychromatic fancies, for those blocks of granite, 20 ft. by 12 ft., grey as they were at the creation, and worn as though by whole cycles of slow, unviolent, change. The two great epochs of Indian history stand forth here in a contrast and identification the most absolute conceivable, unless we give the palm to the Pagodas of Chillambaram, those seven sisters—or Lamps, if we prefer it—of a remote and mysterious art which carry in each of them the meaning of an entire mythology, dark, melancholy, and mysterious, but not exclusively black. They are varied by porphyry statues, and columns of sandal wood, by constantly renewed dedications of flowers, and by blazonries of polished copper, but never by a gem, a dash of vermilion, or so much as a square inch of mosaic. Why they were erected, human knowledge has never yet been able to say; but that they are the trophies of war, like the monuments of the Moguls, no student of the Indian chronicles will believe. Those men, to all appearance, reared their temples as expiations; the Moguls reared theirs as triumphs.

We will end as we began, by recommending to our readers "India and its Native Princes."



GATE OF ALLADEEN, KOOTUB, NEAR DELHI.

LONDON STREET ARCHITECTURE: OFFICES, CORNER OF THREADNEEDLE STREET AND BISHOPSGATE STREET.—Mr. Theodore K. Green, Architect.

NEW BUILDINGS AT THE CORNER OF THREADNEEDLE-STREET AND BISHOPSGATE-STREET.

These buildings, now in course of erection, are on the site of the church of St. Martin Outwich, and the adjoining rectory.

The excavations were commenced in the autumn of last year, but owing to the unsatisfactory nature of the subsoil, the difficulties encountered in maintaining the surrounding buildings, and the change of lessee, progress has been slow. There is a sub-basement over the entire site of church, intended for wine-cellars. The basement and upper floors will be arranged in suites of offices, and the ground-floor is an open space over the entire area. It is proposed to face the whole of the building with Portland stone, and to construct all floors and partitions with fire-proof materials.

The perspective view is taken from Bishopsgate-street, and represents the building as originally designed by the architect; but we are informed that there is a probability of the height being somewhat reduced in execution to meet the objections of adjoining owners, who consider that their light may be somewhat injured. Mr. Shepherd is the contractor, under the superintendence of the architect, Mr. Theodore K. Green.

THE PLASTERERS' COMPANY AND TECHNICAL EDUCATION.

This company, with the object of promoting technical education, as applied to its own special industry, has offered for the past eleven years prizes for modelling and for design to students in the art schools and artisan classes in connexion with the Department of Art, South Kensington.

A report just published by the company says as to 1874–5:—"The subjects for competition for the past year were,—

1st. A Model in Plaster for an Ornamental Bracket, intended to support a Bust or Statuette. Modelled and designed by the competitor.

2nd. A Design in Monochrome for the Ornamentation of a Doorway, capable of being executed in plaster.

Eight models were sent in for the bracket. That of Joseph Ellis, of Hanley, gained the company's first prize of 7*l.* 7*s.*, to which a national silver medal has been awarded. The second prize of 4*l.* was gained by Sidney Currie, of South Kensington, and a national bronze medal. A bronze medal has also been awarded to a model by D. Buchanan, of Glasgow. Three other models have gained third-grade prizes,—namely, two from South Kensington, and one from Birmingham.

Fifteen designs for the ornamentation of a doorway were sent in; that by Wm. Marshall, of South Kensington, gaining the company's first prize of 8*l.* 8*s.*; and that by Laurie Bisset, of Edinburgh, the second prize of 5*l.* 5*s.*, and also a book prize. Otto Partz, of South Kensington, is awarded a bronze medal for his design; and nine other students, third-grade prizes,—namely, three from the art schools of Lancaster, and one each from Belfast, Cirencester, Glasgow, Coalbrookdale, Edinburgh, and Sheffield."

The subjects for competition for 1875–6 will shortly be published.

SANITATION IN MADRAS.

A Sanitary Association has just been set on foot in Madras, and has inaugurated its career by calling the attention of the local Government to a rather formidable list of grievances which demand immediate removal. The chief of these is the prevalence of bad smells in various parts of the city; the existence of a large number of open drains in which offensive matter is allowed to accumulate, and by which the surrounding atmosphere is tainted; the system of burial in the existing burial-grounds, graves being dug so near the Cooum (a sluggish river which runs through the most populous districts) that water freely percolates, and the river is consequently contaminated; the insufficient supply of latrines and places of public accommodation, and the consequent perpetration of public nuisances; and lastly, the character of the water supplied by the waterworks, which is at times discoloured and offensive in smell, owing either to the want of a proper system of filtration, or to percolation of sewage matter into the water-pipes in places where they have been laid in close contiguity to, and at a lower level than, the street drains. If matters are in this state, it is little wonder that epidemic cholera was present in Madras during the hot season, and that the death-rate is higher than in the other presidential cities.

SPECIFICATIONS.

In the course of the introductory lecture in opening the engineering classes of Glasgow University, Professor James Thomson made the following remarks:—I propose, before entering on the routine business of our course, to make some general remarks, and to give emphatically some general advice, which I hope may be engraved on your memories, and may happily tend to bear good fruits in after years to yourselves and to the clients for the designing of whose works your services may be engaged, and may tend to promote the honour and dignity of the profession, whether of civil or mechanical engineering or architecture, to which you may ultimately apply your energies. One of the most important duties towards the good performance of which it ought to be your ambition to aim is the designing of works and arranging for their execution, and giving the necessary superintendence, to ensure, as far as may be, that they they shall be well and successfully carried out. For rendering it possible to perform such duties well, engineering science, whether acquired mainly through studies entered on in a university course of engineering education, and followed up with the attainment of practical experience in actual works, or acquired without the aids that university teachings can afford, is in most cases essentially necessary. Mathematics and natural philosophy are two of the most important elements in an engineering scientific education; but they are not all that is wanted. There is a mistake into which the college student of engineering is occasionally liable to fall, and which in some cases is found showing itself prejudicially in subsequent years, when he is engaged in the practical business of life, but which usually is rubbed off in the rude jostlings of experience. It is the mistake of having a too great longing for means of attainment of mathematical exactitude in subjects which from their nature do not admit of the judicious application of any elaborate or very refined methods or processes. In by far the larger proportion of cases in which important action must be taken a rough-and-ready decision is all that is wanted, or, at any rate, is all that is possible. If, however, the engineer or architect is well prepared with scientific principles to aid his judgment,—if he is intimately acquainted with the physical properties of materials,—if he is accustomed to take a comprehensive view of the relations and mutual influences of the different parts of structures in numerous and varied cases, with the aid of exact mathematical investigations in cases where mathematics may be truly applicable,—and if, too, his mind is amply stored with practical knowledge and experience, his decisions are likely to have more of the ready and less of the rough in their character. Mathematical investigations exact and, it may be, complicated, and involving refined and delicate physical considerations, have often very important practical uses in engineering, in architecture, and in naval construction. To you, as students in this University, there is no danger of the importance of these subjects passing unnoticed and unknown; but there is a danger of quite another kind, against which a timely warning given may be of vital consequence. It is the danger of being misled by bad advice, or bad usages, into neglecting to make efforts, with due vigour and determination, to have your designs complete, or as complete as they may, or can, or ought to be, before you will draw your client on, or allow him to go forward, into having the execution of them proceeded with. In so far as you allow your plans, in a state in which you ought better than any one else to know that they are incomplete and immature, to be begun and proceeded with in execution, you are laying up vexations for all concerned—losses and disappointments for your employer, and therefore grief for yourself. Now I have to tell you that the designs for the execution of any important piece of work, and even for the execution of pieces of work of minor importance, in almost all cases cannot be completely made and completely exhibited by drawings alone. It is necessary also in each case for the designer to write out a specification of various particulars to be attended to in the execution of the work. The nature and scope of a specification for the execution of works must depend on the manner in which it is intended that the work shall be carried out; but, in any case, it ought at least to contain clear explanations of many things which the drawings alone do not fully exhibit, and perhaps even could not be made completely to indicate. While an architect or an engineer is proceeding with the making out of drawings for any projected work he ought constantly to keep at hand a set of sheets of paper on which to jot down his notes for a specification; because, during the attempts to perfect the drawings, many things are likely to be thought of which ought to be distinctly stated as written instructions for the builder or maker, but which, if not noted at the time, may be liable to be afterwards overlooked and forgotten. Then, when the drawings are complete, or are supposed to be nearly so, the time comes for writing out a specification in all its desirable completeness. The primary and main object of a specification may be briefly described as being to give, fully and clearly, all necessary and useful written explanations and instructions for the execution of the work; and, in the case of works to be executed by contract, for making due preparations for the effecting of a definite and clear bargain between the contractor offering to execute the work and the person or company accepting his offer. But, while this is the primary and main object, there are two incidental objects of no trivial importance, which I shall now mention:—First, the specification, when submitted to the person or company for whom the work is to be done, affords the best possible means for understanding the drawings, and for judging on many points in the proposed scheme, which, though perhaps of great importance, would otherwise have escaped notice; and, secondly, the requirement for a good and clear specification involves this most important condition with the architect or engineer himself; that, in fact, he cannot draw it up at all, without first finding out what the design or work is that he wants to specify definitely, and what parts of his project must considerately be left unsettled and open for future decision. When he applies himself with earnest determination to draw up a specification well, he can scarcely let much pass unnoticed by mere inadvertence, as he is quite apt to do when he proceeds without a specification. I have been led to make these remarks because I have learned that a practice is adopted and worked upon by many architects,—worked upon very generally in the profession, it has been from various quarters strongly asserted, but I will not believe in the imputation as applied to the profession generally,—a practice, namely, of giving the instructions to the builders by drawings insufficient to exhibit the work at all completely, and by what are called bills of quantities, and of arranging the bargains by means of "priced lists"; but without any writing whatever of the nature of a specification. What, then, is the obstacle that leads into the omission of this all-important means towards the complete exhibition of a design? It is, ordinarily, just this: that the designs themselves have neither been fully delineated on paper in the drawings, nor have been formed with sufficient completeness in any human brain. When work is begun in this way, things sometimes go forward at first with great ease and satisfaction,—each person is relying upon the others; and even the architect himself has not distinctly realised how incomplete the designs and instructions he has given really are. But soon a time arrives when difficulties begin to show themselves; some things are found to be ill-arranged in their relations to other things; some things essential to be contrived have been unnoticed or forgotten altogether; the builders have to spend much valuable time that ought not to have been required in calling at the office of the architect to ask what they are to do next, or how they are to proceed with some part of the work already begun or far advanced, but in respect to which some alteration of plan is contemplated but not yet arranged or decided on. Troubles and anxieties proceed; but now I will draw the curtain over my unfinished picture of the consequences of proceeding to the execution of important works without a specification.

The Drainage of Potton.—At a meeting of the Biggleswade Board of Guardians, on the 10th inst., it was resolved, on the motion of Sir John Burgoyne, "That the scheme for the drainage of Potton which had been submitted by Mr. Miller, inspector of nuisances, be carried out forthwith, and that application be made to the Local Government Board for a loan of 900*l.*"

WATER SUPPLY OF THE METROPOLIS.

In the course of the opening address at the Society of Arts, on the 17th inst., the President, Lord Alfred Churchill, who reviewed all that had been done by the Society during the past Session, said:—

The results of the inquiry directed by the Council into what could be done for the prevention of the spread of fire and conflagration, led to the further inquiry how far the application of science and art might be brought to bear on the special improvement of the entire water-supply of the metropolis. This important subject still awaits the attention of Parliament to the Bill based on the conclusions obtained by the inquiries of the Special Committee appointed by the Council. In the Session before last, that Bill was thrown out by the unexpected opposition of the water companies, for there was reason to expect that they would not have opposed its being taken into committee on the main question affecting them. Last Session, compensation facilities were promised on the part of the Government, which it appeared they were unable to realise. But towards the end of the last session, public attention was roused, and in another measure which came before Parliament the popular sentiment prevailed, and a precedent was established, that measures affecting the security of life and property should have the precedence over those that do not. On this new and humane principle it is to be hoped that a due place will be yet accorded to a measure which, as relates to the metropolis, would prevent at least two out of three of the losses of life and personal injuries that regularly occur from fire, and save the great majority of the regular annual sacrifice of more than two hundred lives. It must be remembered that an improved water supply has not reference merely to prevention of fires, but largely affects the health of the population, and greatly facilitates the cleaning of the streets. Thus, proper measures would certainly prevent the injuries annually done to more than two thousand persons in the streets. All this has been clearly shown by the elaborate report issued last session by the committee of this Society. The President of the Association for the Promotion of Social Science, at the meeting held at Brighton, late a Secretary of State for the Home Department, ascribed a large amount of the existing criminality to the widespread drinking-habits of the population. But what more powerful cause contributing to drinking habits is there than impure or repulsive supplies of water,—of water which, if pure at its source, is made impure by the intermittent mode of distribution, which detains it in butts and vessels in crowded rooms, where it is kept stagnant, and absorbs the mephitic gases, and is made mawkish, offensive, and repulsive? It is not pretended that the provision of pure water is in itself a specific against the great evils of the drinking-habits of the population, described in a recent important article in the *Quarterly Review*, but it certainly goes to the removal of a great provocative. Our late lamented member, Mr. William Fairbairn, excluded the beer-can rigorously from his works, but he took care to provide for his people the best pure water that could be got. It would have been a sorry conclusion if he had left them the alternative only of water made repulsive by stagnation, in water-butts over cess-pools, or water de-aërated in crowded rooms. The present conditions of the metropolitan supply, besides great waste, are inferiority, if not impurity, in the sources from whence the supply is drawn. It was shown by Mr. Quick and Mr. Rawlinson, and other practical witnesses, that fully one-half the water pumped into the metropolis on the intermittent system is pumped to waste. This is confirmed by the fact that by measures conducted by Mr. Deacon, at Liverpool, where the supply is on a public footing, the consumption has been reduced from 33 gallons on the intermittent system, to 17 gallons per head on the constant system. It follows if that system were adopted in the metropolis one half of the 110 millions daily pumped might be saved, the other half being now pumped to waste. Nearly all this half, or 58 millions, is pumped from the Thames, which is yet sewer tainted, and tainted, at times, very much with the surface washing of heavily manured lands, giving matter in solution for drinking purposes which filtration has as yet failed to remove. There is, however, another source of crime to which the present conditions of water supply are contributory to an extent to which the right hon. gentleman must have been ignorant. At present the services of the fire brigade and its engines are limited as a rule to the prevention of the spread of fires beyond the premises where they occur. The incendiary for insurance money is pretty sure to have his object accomplished, and the trace of his work is limited to the particular house, and obliterated before the fire engines can arrive. How systematic all this work goes on is shown in the evidence collected by our member, Mr. McLagan. Mr. Tozer, in his evidence, showed that one third, at least, of the serious fires in London, are not accidental, but intentional, and criminal. But if water can, by means of hydrants, be applied, as it is proved it may be, in two minutes instead of twenty-four by fire-engines, incendiary speculators for insurance money are baffled. Whilst the supply of the metropolis still remains in the hands of private companies, and there are eight of these companies who divide the metropolitan supply among them, it is obvious that the first and main object must be, and indeed it is their duty, so to manage their affairs as to give the largest amount of dividend to their shareholders. This can hardly be consistent with a due regard to the perfect interest of the consumers. Doubtless, under unity of management, large economy could be effected, and, if administered on a public footing, the water supply might be rendered far more effective for the public benefit. A constant supply, with hydrants at frequent intervals, might be obtained without further burthen on the ratepayer, who would thus obtain a more adequate protection from fire, and increased facilities for cleanliness in the streets. Manchester and Liverpool are instances in proof. If unity of works and management had been got when it was first proposed, the extension of duplicate and triplicate trunk mains (one of them, extending from east to west, costing upwards of a million of money), extended reservoirs, providing for a waste, under the present system, of nearly double the actual consumption, would not have been incurred. Now, nearly the actual draught from the Thames, and the continuance of multiplied establishments, might all have been spared, and the expenditure of some three millions of money might have been, by unity, prevented, and the shareholders have received improved dividends from the profits which have gone elsewhere. It is to be observed that the Metropolitan Board of Works have, in consequence of the complaints on account of the increased rating by the water companies, given notice of a Bill to equalise the rate, and to extend a system of supply by meters to private houses. In this course, leaving the supplies to the separate companies as they are, that Board practically confirms the conclusion come to as to its ineligibility, from the restricted area of its jurisdiction and other causes, to take upon it the responsibility of undertaking the supplies directly for the public. But it is apprehended that, as separate works and extensions, and expenditures for them to an indefinite extent, must still go on, together with the expenditure on multiplied establishments and directorates, that any considerable augmentations of dividend to the shareholders, or any material reduction of rates to the consumers, must be very remote. The only practical source of considerable economy and early relief must be sought in the economy and great gains of unity of management on a public footing. Col. Beresford, the member for Southwark, has renewed his notice of a Bill on the basis of the report of the Special Committee, which, it is acknowledged, has done gratis the work of a very special commission on the subject. But it is submitted that the work is of a nature that ought not to be left to them, or to any private member, however competent, nor to any overworked sub-department, and that it is befitting the care of a superior department and Cabinet Minister.

AN OUTING.

CRYSTAL PALACE SCHOOL OF ENGINEERING.

This growing institution made the usual trip of inspection for the present term on the 11th and 12th inst., and as the lectures given by the Principal during the term now proceeding are upon "Materials and their Manufacture," it was arranged that this tour of inspection should be to the Black Country, and accordingly, arrangements having been entered into, and the kind co-operation of the managers of the various works to be visited having been secured, a party of upwards of fifty, including the Principal, Mr. J. W. Wilson, C.E., the assistants, and students, availed themselves of the special facilities offered by the London and North-Western Railway Co., and proceeded to Birmingham by the early express on the 11th inst.

On arriving at Birmingham, the party at once proceeded to visit the celebrated works of Messrs. James Watt & Co., passing on thence to the Patent Bolt and Nut Company's Works, and thence to the Birmingham Tube Company's Works. At all these places the most courteous reception was afforded to the party, who returned to their hotel at Birmingham, and dined together there.

The works of the Earl of Dudley at Round Oak, near Dudley, were inspected on the Friday morning, and by the kindness of the managers the whole process of iron manufacture was seen in actual progress. The visit to these works terminated in a descent to the "Robin Hood" Coal-mine; after which the party took train to Wednesbury, and, entering the Patent Wheel and Axletree Company's Works at that place, were enabled to view the Bessemer steel-converting process at work. Thus concluded a most interesting and instructive series of visits, and the dinner, which brought the expedition to a close, terminated in a hearty ovation to the Principal for the management of the tour.

NOTES FROM CANADA.

Canada is blessed with some of the finest lakes in the world, and instead of the Indian gibberish names, it would be as well to rechristen them with something one is able to pronounce. Many years ago, the writer was taken by his father to see the Ojibbeway Indians, then exhibiting in London: little did he think one day he would visit them in their peaceful homes, and a very different kind of "pusson" the Ojibbeway is from the noble savage he appeared to be, with his highly-coloured face, painted and feathered as shown in London.

The really gorgeous and magnificent lakes up the Gatmeau and Grand River are removed from civilisation, but there are a number of grand lakes on the Northern and Midland Railways of Canada, and were it not for the mosquitoes and sand flies, these places would be considered a hunter's paradise.

The termini of the Midland Railway is at Port Hope, a city most remarkable for its picturesque beauty, abounding with hills and valleys that somewhat remind one of the Isle of Wight, minus the fine buildings; but let us hope the days of the wooden band-box houses are numbered now brick is being used, which will cause architecture to be more closely studied.

Just on the borders of the town overlooking the noble lake of Ontario is a fine residence surrounded by a splendid park owned by Colonel Arthur Williams, a son of one of our noble salts of the brave Nelson days. The Colonel, with a liberality worthy of emulation, does not lock the gates of the park, and put up high palings, so that the tops of the lofty pines and splendid oak and maple trees may be seen over a high fence, but portions off the park for the use of the general public, and good cricketers are not shy in living up to the privilege allowed by the worthy Colonel. In the midst of the park is the owner's residence, a brick and stone building after the Elizabethan style.

The Midland Railway runs north, its final stopping-place being at Orillia, a small but flourishing little town, full of life and bustle, with every sign of expansion; there are a few miles of railway almost ready for traffic from Orillia to a place called Wanbeshene, and at some future time it is intended to extend the railway to the Georgian Bay, thus completing what no doubt will make the Midland Railway a success. Orillia is situate in close proximity to a most magnificent tract of water, studded with innumerable and picturesque islands. The village of Oashago and Rama border the Lake Conchiching. Rama is the Ojibbeway Indian settlement, and the tribe are a very peaceable class of people, living chiefly by hunting and fishing; they have a very noble look, and not so puny and skin-dried as the half-breds of Lower Canada are.

A large summer hotel has been erected on Lake Conchiching, affording a good deal of accommodation to tourists, hunters, and private families who flock there. The grounds of the hotel are laid out very decently, affording a good deal of accommodation for the lovers of croquet, cricket, and base ball, and a part has been allotted for a bowling alley. Three steamers navigate the lake

to the Falls of Muskoka, the lakes Severn, Simcoe, Sparrow, and Muskoka trading Lake. These lakes abound with salmon, salmon trout, black bass, pickerel, and other kinds of fish. Hunting just now is also good; plenty of deer and wild ducks. QUERCUS.

THE ARTISANS' DWELLINGS ACT IN THE CITY.

THE new Lord Mayor, Cotton, in the course of his first address at a meeting of the Common Council, said he thought he might be excused for referring on the present occasion to a subject of a very serious character. They were aware that a very important Act of Parliament, the Artisans and Labourers' Dwellings Act, had recently come into operation, and that the Government had conferred the privilege upon the City of London of being the authority for carrying out the provisions of this Act within the City of London. This privilege had been granted in perfect good faith and sincerity, and with the full belief that the City of London would carry out the Act loyally and to its full extent. They now possessed the power of pulling down all those places within the City that had been truly described as plague spots, and which were the constant sources of disease. He should be happy to render all the assistance in his power to carry out these important objects, and he was glad to see that the Commissioners of Sewers, who were the body specially appointed for the purpose, had already taken proceedings to carry out the Act of Parliament, and that they had resolved at once to pull down in one particular locality what had for a long time been complained of as containing residences and dwellings that were totally unfit for human habitation, and that they had resolved to do this important work as speedily as possible. This Act of Parliament gave them the power almost to rebuild the City of London; and as so much had been done in the way of building palaces within the City, it was most satisfactory to find that steps were now being taken to provide suitable residences in the City of London for the artisans and labourers who were employed within it. He would only add that he believed this Act of Parliament was quite clear in its provisions, and that it could easily be carried out; but he might state that if any unforeseen difficulty should arise in the course of the proceedings taken by the Commissioners of Sewers he should be happy to introduce a deputation to the Home Secretary to ascertain his opinion.

SHAKSPEARE MEMORIAL AT STRATFORD.

THE designs for the theatre, library, and picture-gallery are to be, in the first instance, sketch designs from architects desirous of competing for complete designs and plans. From these not fewer than five nor more than ten will be selected by the council, and the architects furnishing the designs so selected will be invited to send in finished and complete designs in competition for the Shakspeare Memorial, upon the understanding that the author of the design eventually selected shall (subject to satisfactory arrangements being made) be employed as architect of the building, and be paid the usual professional remuneration on the outlay. To each of the other competitors so selected who may send in finished and complete drawings in the second competition, the sum of twenty-five guineas will be paid by the council. The council will exhibit the designs and original sketches, either before or after adjudication, and in the selection of designs the council will seek professional aid.

The building is to be an ornamental structure, and will stand isolated in a garden, and be seen from all sides.

The cost named for the building, but without statuary, is 8,000*l.* to 10,000*l.*

The council consider that 5,000*l.* or 6,000*l.* should enable them to complete the theatre sufficiently for temporary use.

The Inhabited House Duty.—In a recently-issued Parliamentary paper an analysis is given of the inhabited house duty, which amounted last year to 1,381,116*l.* 7*s.* 3¾*d.* The annual value of shops and warehouses assessed at 6*d.* in the pound was 9,628,015*l.*; beerhops, at the same assessment, 3,770,153*l.*; farmhouses, at the same, 768,806*l.*; while the annual value of dwelling-houses at 9*d.* was 29,727,139*l.*

COST OF NEW VIADUCT, CARLISLE.

ON the 12th inst. the Carlisle Town Improvement Committee let the contracts for the construction of a new viaduct to Mr. T. B. Nelson, of Carlisle and York. The contract was offered in three divisions. No. 1 consisted of the bridge and works lying on the east side of the railway, as carried out upon arches; No. 2 consisted of the same works carried out upon brick retaining walls; and No. 3 comprised the works on the west side of the railway. Seven contractors competed. Mr. T. B. Nelson's tender for the whole work amounted to 13,241*l.* if executed with arches instead of embankment, and 12,205*l.* if carried out with brick walls and embankment, according to the original plan, the railway companies supplying the "muck." The tenders, according to the *Carlisle Journal*, were as follow:—

	£.
Armstrong,—	
No. 1 (6,839*l.*) and No. 3 (10,361*l.*).....	17,200
No. 2 (6,612*l.*) and No. 3 (10,361*l.*).....	16,973
McKenzie & Co.,—	
No. 1 (7,245*l.*) and No. 3 (9,861*l.*).....	17,106
No. 2 (6,390*l.*) and No. 3 (9,861*l.*).....	16,251
Dawson,—	
No. 1 (7,444*l.*) and No. 3 (9,333*l.*).....	16,777
No. 2 (6,044*l.*) and No. 3 (9,333*l.*).....	15,377
Jackson,—	
No. 1 (6,303*l.*) and No. 3 (9,620*l.*).....	15,920
No. 2 (6,145*l.*) and No. 3 (9,620*l.*).....	15,765
Ward,—	
No. 1 and No. 3	15,728
No. 2 and No. 3.....	15,348
Lees & Co.,—	
No. 1 (5,368*l.*) and No. 3 (8,010*l.*).....	13,378
No. 2 (5,614*l.*) and No. 3 (8,010*l.*).....	13,624
Nelson,—	
No. 1 (5,754*l.*) and No. 3 (7,487*l.*).....	13,241
No. 2 (4,718*l.*) and No. 3 (7,487*l.*).....	12,205

SURVEYORSHIP ITEMS.

Ramsgate.—At a meeting of the Ramsgate Local Board on the 16th inst., the principal business transacted was the election of a surveyor from the four candidates selected at a previous meeting, viz., A. W. Conquest, Clapham; B. M. Hiscocks, Wandsworth; R. H. Inch, Croydon; C. M'Callum, Dover. Each candidate appeared before the Board, and was examined by Mr. H. Hinds as to his general acquaintance with the following subjects:—Testing cement; ventilation of sewers; treatment of house refuse; disposal of sewage; construction of hydraulic works; distribution of water and of gas; and mathematical analysis. Eventually it was unanimously resolved that Mr. William Alexander Conquest be elected to the office of Surveyor and Inspector of Nuisances. Mr. Conquest is at present employed by the Metropolitan Board of Works in preparing Parliamentary plans for the approaching session. His testimonials included a strong recommendation from Sir Joseph Bazalgette.

Sevenoaks.—A special meeting of the Sevenoaks Local Board was held on the 15th inst., for the purpose of appointing a surveyor, five out of the fifty candidates having been requested to attend. The selected candidates were Mr. W. G. Bennett, Warrington; Mr. G. Detterfield, Rochdale; Mr. J. Hook, Brighton; Mr. James Macdonald, Glasgow; and Mr. James Macgregor, Edinburgh. It was unanimously resolved that Mr. Macdonald should be appointed surveyor, at a salary of 150*l.* per annum. Mr. Macdonald will enter upon his duties on the 1st December.

Lambeth.—At a meeting of the Lambeth Vestry on the 18th inst., a letter was read from Mr. Hugh M'Intosh, the surveyor, asking for an increase of salary. Mr. F. H. Fowler, in a speech of some length, alluded to the increased duties discharged by the surveyor, and his high qualifications for the office which he held. He moved that his salary be increased from 500*l.* to 600*l.* per annum, and the allowance for expenses from 200*l.* to 250*l.* per annum. The motion was seconded, and carried by 75 to 3, after a long discussion.

Sheffield.—At a meeting of the Sheffield Town Council, on the 9th inst., a letter was read from Mr. S. F. Holmes, intimating his intention to relinquish, as from the 6th of December next, any further payment on account of his appointment as Consulting Borough Surveyor, which office he has held since his retirement from the Borough Surveyorship, but expressing his readiness at all times to give such advice and information to the Borough Surveyor for the time-being, as, on account of his (Mr. Holmes's) long connexion with the town, may be useful to him. The letter also notifies Mr. Holmes's determination to retire from the engagement entered into by the resolution of the Council in July last, appointing him to negotiate on behalf of the Corporation for the purchase of properties required for the contemplated street improvements.

Haslingden.—At a meeting of the Haslingden Local Board, on the 3rd inst., the selected candidates for the appointment of surveyor (Messrs. Patterson and Duckinfield) were called in, after their applications and testimonials had been read, and several questions put to them. Both candidates stated that if appointed they were prepared to devote the whole of their time to the duties of the office, and also to reside in the town. The votes were taken by ballot, when there were thirteen in favour of Duckinfield, and four for Patterson. It was then resolved that Mr. Duckinfield be appointed.

Spennymoor.—At a recent meeting of the Spennymoor Local Board, Mr. Robinson, of Bedlington, Northumberland, was appointed surveyor and inspector of nuisances, at a salary of 130*l.* per annum.

Hythe.—Mr. Allen Gravener, the borough surveyor of Hythe, was accidentally drowned on the 14th inst. He had, during the morning, been inspecting the sea-wall, watching the result of the sea's action upon it, until at length he determined upon an attempt to reach the town some distance to the westward. He had nearly reached No. 13 Tower, when he was washed into the sea by waves. For a few seconds he was lost to view, and when he rose he seemed to be clutching at the bank of the beach, which was nearly perpendicular at the spot. The body was ultimately recovered.

WON BY A TOSS.

THE Liverpool School Board have introduced the system of selecting architects by lot, as their advertisement shows:—

"The Sites and Building Committee propose to form, from names sent, a list of those architects who appear to them specially fitted by experience to undertake the work, and will decide by lot which of the applicants on this list shall be recommended to the Board."

Such a course appears to us derogatory and damaging. It seems to us a way calculated to undermine a profession where *merit* ought to be the chief recommendation. The first proposal of the Sites and Building Committee was to *exclude* all architects who had built two schools. This has since been modified in the way to which we are alluding. It is an illogical thing: the selection does not go far enough. If they select say nine architects, as they did on a former occasion, it must be on the assumption that nine architects equally competent for the work in view can be found in Liverpool,—equal in what is now really a specialty. A School Board should be the last to teach people to depend on *luck*. A general introduction of this way of settling rival claims might be very comfortable and easy, but it is calculated to degrade and damage the profession.

THE SEVENTH AND EIGHTH BOOKS OF STRABO.

IN the old Abbey of Grotta Ferrata, near Frascati, a manuscript has lately been discovered said to contain the oldest text of the writings of Strabo, the Greek geographer, living at the time of Christ, and supplying many gaps of the present MSS. According to the *Cologne Gazette*, fugitive Sicilian monks, who, invited by the Emperor Otho III., had settled in the above monastery, brought with them valuable Greek manuscripts, which they carefully guarded and kept from strange eyes. Cardinal Angelo Mai, who died about twenty years ago, a well-known connoisseur and editor of old manuscripts, extended his explorations and discoveries also to the treasures of Grotta Ferrata. He was followed by Father G. Cozza, who has worked much in Bible manuscripts, and who found during his labours a palimpsest, or *codex rescriptus*, upon which, under a copy of the Old Testament dating from the eleventh century, another older writing appeared when chemical means were applied. It consisted of three columns of Strabo. Soon after several other, larger leaves were found, containing considerable fragments of Strabo—seventeen books on geography, especially of the seventh and eighth books, hitherto considered lost, so perfectly written that it will now be possible to correct the present editions. The

manuscript belongs, according to Father Cozza, to the sixth century; it is consequently older than the twenty-eight manuscripts of Strabo's works known at present.

THE THAMES EMBANKMENT.

SIR,—The trees on the Embankment on the left hand from the City are a disgrace, and must become a mere laughing-stock to any foreigner or one who would point to it as a thing of beauty,—high and low, crooked and stunted, knock-kneed and half-dead. Who now living can hope to realise its would-be attractions? Pay a visit even to the Charing-cross-gardens, and see what is deemed ornamental enough for a central tree of the most conspicuous portion of the ground, viz., a stump, with a few one-sided shoots, deformed in body and crippled in limb. I see a large tree, after standing some eighteen months, has become at last defunct, and has been replaced by another, with an Englishman's eye to putting on door-plates,—lop-sided,—and thus, what might at once be ornamental and prove an improving taste, is marred by an indifference to order and beauty, and only goes to prove the necessity of a Board not only for what should be done, but the manner of doing it. W. S.

STEETLY CHAPEL.

SIR,—Steetly folk will be much obliged to "G. W.," who grudges them the use of a beautiful chapel, long desecrated, but needing little beyond a new roof and internal fittings, and proposes "a small preaching-room" in its place.

Restorers, I am too sadly aware, have done much mischief, but there are men in England who might be trusted to restore even a "perfect gem" like Steetly to the purpose for which it was built, viz., the worship of God, without destroying its architectural and archæological value. The case of Kirkstall is by no means parallel. A vast building which would need a large amount of reconstruction is very different from a small chapel, which, except the roof, is almost perfect. M. A.

A STRONG POINT OF LAW FOR BRICKMAKERS.

IN the County Court of Durham last week, a gardener of the name of Taylor brought an action against John Hirst & Son, brickmakers, for damage done by the heat and sulphurous smoke of their kilns.

The gardener stated that he had a garden at the rear of his house, which borders on a field used by the defendants in the making of bricks. The distance from the brick-kiln to the garden was 38 ft. During the present summer his garden was as black as his hat from the smoke of the kiln, and he did not think there was anything left in his garden that was not damaged. He was certain that the heat and smoke did the damage. He described the various things that had been destroyed. Since the damage had been done, he pointed out the state of the garden to Mr. Hirst, and asked him if it were any use doing any more to the garden whilst the brick-kiln was there, and the defendant replied that he did not think it was. Mr. Hirst was tasting the gooseberries left on the trees, but no leaves, and witness told him he would poison himself.

Cross-examined.—Was certain the effluvium and heat from the kiln caused this injury. Had not plucked any fruit from the garden, as it would have injured anybody to eat it.

The Judge thought it best to see the place himself, and rode over to the kilns, and on his return, Mr. Nicholls, another gardener, said that in July he found the garden a complete wreck. From his experience of forty years he never saw anything like it. Everything was as black as a hat, and appeared to be in a consumption. The crop was thoroughly destroyed, and beyond that there was a further injury. The trees, in his opinion, would never recover.

The Judge asked if the kilns were done away with would the trees recover? The witness said they would not, and he would advise the plaintiff to plant others. He considered the valuation of the injured plants fair and moderate.

The defence merely rested upon the unfairness of the claim.

The Judge said the law was on the side of the plaintiff, for it was not to be endured that brick-kilns should be permitted to destroy gardens or fields in this way. He should award 10*l.* for injury to the garden, and 10*l.* for damage to the crop, and allow full costs.

It was stated that this was a test action, and that other brickmakers will feel the force of the decision.

"THE LESSONS OF THE FLOODS."

SIR,—The article written in your paper on this subject so completely coincides with my opinion, as expressed in a paper I read at the Chamber of Agriculture in April, 1872, that I venture to send it for your perusal. The worst that could have been anticipated from over drainage in this neighbourhood has happened, as the Kennet river is flooded, and great damage has been done. What is to be the remedy? I can only imagine that the storage of water would, to a certain extent, effect a cure. I think the water which now finds its way into the pipes, and thence into the river, should be intercepted by storage, and be made available in case of dry weather.

Newbury. J. T. CARBONELL.

TIDESWELL CHURCH.

SIR,—In correction of the paragraph respecting the restoration of Tideswell Church, Derbyshire, which appeared in the *Builder* of November 13th, will you kindly allow us space to say that the restoration of the De Bower Chantry, in the south transept of that church, was carried out wholly from our designs and under our superintendence, at the sole cost of Mr. J. Bower Brown, J.P., of Woodthorpe Hall.

This work, which was completed some eighteen months ago, included—in addition to the cutting out and replacing of all decayed stonework, &c., and the taking down and rebuilding, stone for stone, of the parapet and pinnacles—a new oak screen and panelling to the roof, stained glass in the windows, marble mosaic floor, and the refixing of the alabaster effigies (*tempus* Rich. II.) of Sir Thurstan and Lady Margaret de Bower on an almost wholly new altar-tomb, in which were incorporated three fragments of the ancient monument which gave the "motive" of the design of the new one, and which had been fortunately preserved by being for years, along with the effigies themselves, half-buried in the earth in a remote corner of the church used as a lumber repository. We are the more desirous of this correction being made, as we endeavoured throughout to preserve every possible fragment of ancient work, and should not like to be considered responsible in any way for the substitution in the chancel of a roof of entirely different type for the one which was existing, though much decayed, when the recent works were commenced: it was a fine, though simple, coupled rafter-roof, from end to end without trusses, showing signs of having been boarded or panelled underneath, and has been replaced by one with hammer-beam trusses, purlins, &c., which, in our view, is by no means so suitable to the somewhat peculiar design of the side windows, and, of course, entirely changes, though not improves, the *tout ensemble* of the place. INNOCENT & BROWN.

CHURCH BUILDING NEWS.

Bredfield.— Bredfield Church, Suffolk, was reopened on the 20th ult., after restoration under the direction of Mr. R. M. Phipson, the Diocesan architect. The church, which is dedicated to St. Andrew, consists of tower, nave, and chancel, without aisles. It is of Perpendicular date, although it appears to have been built on the lines of an earlier structure. The chancel had a fine carved roof till the present restorations were undertaken. It had, however, fallen into decay, and has now been replaced with a roof the principals of which are of pitch pine with the deep wall-plate and collar braces characteristic of the style. The west gallery has been removed, opening up the tower arch, and the old piers have been replaced by low oak benches. The works have been carried out by Mr. Last, of Melton, at a cost of about 700*l.*

Ayott St. Peter.—The old church of Ayott St. Peter, Herts, was struck by lightning and destroyed by fire on July 10th, 1874. A new church has now been built nearer the village, from the designs and under the superintendence of Mr. J. P. Seddon, architect, by Mr. Cornish, of North Walsham, builder, the amount of the contract being about 2,800*l.* besides fittings. The style is Early Decorated. The church consists of a nave, 50 ft. long by 22 ft. wide, with north porch, chancel with semicircular apse, and organ-chamber on the south side, and there is a tower surmounted by a stone spire now in course of construction, the gift of Mrs. Robinson, adjoining this chamber at the south-east angle of the nave. The walls are externally faced with red brick relieved with coloured ornamentation and Box-ground Bath stone dressings. The roofs are covered with local tiles, with terra-cotta ridge crest. Within there is a trefoil-shaped barrel ceiling to the nave, and single-arched ceiling to the chancel, with moulded cornices and ribs, and carved bosses at the intersections. The chancel arch, which is a free adaptation of Early English work, is a special and unique feature, being wholly of "Gris de Flandre" stoneware, modelled and coloured by Mr. C. J. Bailey, of the Fulham Potteries, modelled by Mr. W. E. Martin, sculptor. The glazing throughout is by Mr. J. R. Thomson. The pulpit is of Caen stone, with marble shafts, arcaded panels and carving, and is to have figures of St. Peter, St. Alban, St. Helena, St. Gregory, and St. Augustine, in high relief, by Miss Bonham. The central figure of St. Peter is already in its place. The heating is by a plan invented by the architect, by which air warmed by a Gill stove is introduced through perforations above the chancel arch. Polychromatic decorations of an elaborate character have been applied to the chancel ceiling by Mr. J. R. Thomson, from the designs of the architect. Mr. Pilgrim was the foreman of the works.

Bloxwich.—On the 1st inst. Mrs. Harrison, of Norton Hall, laid the foundation-stone of a new tower for the parish church, Bloxwich, which is now undergoing a complete renovation. In fact, with the exception of the north and south walls of the old building, the church, when restored, will be almost an entirely new edifice. The work is being carried out—according to plans prepared by Messrs. Davies & Middleton, architects, Birmingham,—by Messrs. C. Jones & Son, builders, Birmingham. The cost will be about 3,400*l.* The restoration will be such as to entirely change the character of the style of the church, which was formerly a very plain building with no architectural pretensions. The old circular windows have been taken out, and Gothic ones with stone architraves substituted.

East Allesley.—The new church of St. Andrew, Eastern-green, Allesley, near Coventry, was consecrated on the 4th inst. The church is in the Early English style, and is built of red brick with Bath-stone dressings. The tower is surmounted with a spire 80 ft. in height. The church will accommodate 150 persons, and the new school adjoining is large enough to accommodate seventy children. The cost of the erection of church, the parsonage-house, the school and house for schoolmistress (exclusive of the site), was upwards of 6,300*l.* The architect was Mr. S. S. Teulon, of London, and the builders were Messrs. Hallam & Co., of Coventry.

Mulbarton.—Mulbarton Church, Norfolk, was re-opened on the 11th inst., after being enlarged by the addition of a new north aisle, which renders the gallery unnecessary. The new aisle is connected with the nave by three boldly carved stone piers and arches in the Decorated style. The new aisle is 12 ft. wide, and has a pitch-pine roof, forming a lean-to against the nave, with principals and carved tracery spandrels. The church is warmed by the apparatus of Mr. Boulton, of Norwich. The south porch has been entirely restored, with a new roof, and windows, gables, coping, &c., all of which had been much mutilated. The cost has been upwards of 900*l.* The works have been executed from the designs and under the superintendence of Mr. Phipson, F.S.A. The works were executed by Messrs. Ludkin & Son, of Banham.

Slough.—A meeting has been held at Slough in furtherance of a proposal to enlarge and improve Slough parish church. Mr. John O. Scott is the architect who has been consulted in the matter. The intention is to build at once at the east end of the present building the first and most expensive half of a new church, and gradually to work westward.

Kimbolton.—The church of St. James, Kimbolton, has just been re-opened, after restoration. The whole of the roofs, which were found to be in the last stage of decay, have been reconstructed in their original form, in Baltic fir, stained and varnished. New buttresses, with splayed weatherings, have been placed where needed, and the existing ones restored to their original state. All the exterior stonework is executed in Luston stone. The chancel roof is entirely modern, and of low pitch. A new chancel arch of bold design has been put up, having pitched granite responds, with carved caps and bases; the archway between nave and tower being thus opened, adds greatly to the internal appearance of the church, which, with the framed rafter, affords, as viewed from the west end, an excellent perspective. A new archway of freestone has also been inserted between the nave and south transept, and, occupying its full width, the whole of the seats command a view of the pulpit. The restoration of the chancel has been carried out under the direction of Mr. Ewan Christian, architect to the Ecclesiastical Commissioners, at a cost of about 350*l.*, and the whole of the remaining works of every kind from the designs and under the direction of Messrs. Haddon, Brothers, architects, at a further outlay of about 1,200*l.*, the builder for the whole being Mr. Charles Edwards, of Leominster.

Neston.—The new parish church of St. Mary and St. Helen, Neston, Cheshire, has just been opened. The style adopted by the architect, Mr. F. Doyle, of Liverpool, is Early English. Red sandstone from local quarries has been used externally. The whole of the columns dividing the nave from the aisles are of white stone, and the dressings of the windows are of red stone slightly mixed with white. The chancel is of polished ashlar, with serpentine marble columns. There is seating for 700 persons. The total cost, including numerous gifts, was 7,000*l.* The contractor for the building of the church was Mr. William Tomkinson, of Liverpool; the reredos and the carving generally were executed by Mr. J. Rogerson, of Liverpool; the organ was built by Messrs. Whiteley, of Chester; the heating apparatus was carried out by Messrs. J. R. Cooper & Sons, Liverpool; and the lighting by Mr. Dovey, of Manchester.

Semley.—The parish church of Semley, Wilts, which has been newly rebuilt, was re-opened on the 20th ult. The old church having for many years been in a damp and dilapidated state, an appeal was made to the Marchioness of Westminster, who instructed Mr. T. H. Wyatt to prepare plans for a new church. The foundation-stone was laid by her ladyship on the 24th of March, 1874. The church, which is in the Decorated style, is built of local stone with Bath stone dressings. It consists of a nave, 53 ft. 6 in. long, by 22 ft. wide, and 35 ft. high; a south aisle, 53 ft. long, by 12 ft. wide, divided by an arcade of four arches, supported by pillars of Ham-hill stone, with finely-carved capitals. At the east end of the aisle is an organ-chamber, 16 ft. by 16 ft., leading into a vestry, 9 ft. by 12 ft. At the west end is a tower with battlements and staircase turret at the north-east corner. The tower is 85 ft. 6 in. high to the necking of the turret. The whole of the work has been carried out by the contractor, Mr. T. B. Miles, builder, of Shaftesbury, at the cost of about 4,200*l.*, exclusive of the chancel. The stone carving was executed by Mr. John Hamlet, of Reading.

Gloucester.—The new church dedicated to All Saints, Gloucester, was consecrated on the 2nd inst. The church consists of a nave, with north and south aisles, chancel and south chancel aisle, two vestries (one for clergy and the other for choir), with heating-chamber beneath, and organ-chamber above. The building is entered by a porch, 10 ft. by 9 ft., at the western end of the south aisle, and also by a doorway at the corresponding part of the north aisle. The nave is 76 ft. long by 26 ft. wide, and is 53 ft. high to the ridge of the roof, which is of wagon shape, boarded and panelled. The work is in the Decorated style, the windows being filled with elaborately-designed tracery. The nave and aisles are furnished with open seats. The chancel stalls, altar, and lectern are of oak; the pulpit is of stone, with solid base, and is richly panelled. The font is of octagonal form, having sacred emblems carved in the traceried panels. All the doors have hinges of wrought iron-work. The east window of the chancel and that to the chancel aisle have been filled with painted glass by Messrs. Clayton & Bell, at the cost of the Misses Hedley, who have given some 2,500*l.* towards the church, and have also presented the communion-plate and the appointments of the communion-table. The chancel is 33 ft. 6 in. long by 20 ft. wide, and is 48 ft. high to the top of the ridge of the roof. The chancel aisle is 22 ft. long by 15 ft. wide, and the aisles to the nave are 76 ft. long by 14 ft. wide and 22 ft. high. Sir Gilbert Scott, R.A., is the architect, and Mr. Clutterbuck, of Gloucester, the builder. The iron-work has been supplied by Messrs. Potter, of London, and the tiles for the chancel floor are from Messrs. Godwin & Co., of Lugwardine.

THE MANAGEMENT OF HASTINGS.

Sir,—In common with many of my fellow-townsmen, I am grateful for the observations in your last number. We are anxious that the right should prevail, and that a town-hall should be erected worthy of such a place, and on a spot where it will have a chance of being seen, and be an ornament to the town. You probably know under what fearful disadvantages we labour from old-fashioned obstructives, who have ever ruled this borough! The council have domineered over everything and everybody. Elected solely on politics, and the same men nearly always returned, it is strictly true (more is the disgrace) that the council has been the "Master of the ratepayers."

Hastings is very badly off for water; St. Leonard's is little better off, and now the Hastings Council propose to deprive it of some of its too meagre supply. It is too long an account to commence now.

The same member who opposes the Castle Hotel site for the town-hall also opposes any liberal supply of water, advocating water by measure as gas is measured. As he was told at a public meeting in the midst of a recent water famine in Hastings, had there been no more gas to measure by meter than there at that time was water, Hastings would have been in total darkness.

The same "penny-wise and pound-foolish" plan which prevails with a few will be the ruin of this borough; it is applied to all matters,—town-hall, water, roads drains, &c. Hitherto we have been tyrannised over by the Town Council. Much as a town-hall may be and is wanted for this borough, you will agree with me that a good supply of water is even more important still. But I suppose it would be impossible to get up a public meeting here for any matter touching water or any sanitary question. Everything of that sort is supposed to be perfect in a watering-place; not a word must be uttered about bad water and an insufficient quantity. There are but few who would not condemn such action. Why? Because they say, "Oh! people won't come if you say a word suggesting a doubt about the perfection of every sanitary point." Consequently, the public voice is shut in a place like this upon all sanitary matters, however bad they may be. The Council know the universal fear; they wrap themselves up in the security that they find in the belief that no one will venture to speak out about the water as they have about the town-hall site. Therefore, the Council feel they are "masters of the ratepayers," as the chairman of the Water Committee faithfully,—too faithfully,—represents the position, and the Council feels it can do as it likes on that subject anyhow.

"The Brighton and London papers will please copy" speeches made about water. So it is feared therefore no one will move to get up such a meeting as was got up about the town-hall. Our only hope is the London press. The people here think that if nothing is publicly promulgated from this borough the world will be kept in ignorance of our actual position. Unless the London press take up these subjects there is no hope or help for us.

Frequented as these places are by so many from all parts of the world, the question is emphatically of great public importance. As such I hope you will come to the rescue, and help rouse the ratepayers here out of their apathy, and stimulate them to acts which will prove to the Council that members of the Council are under the control and governance of the ratepayers, and not *vice versâ*.

No towns can possibly be more backward than these. The fearful floods of Sunday week would not have been half so destructive as they were but for the working of the "penny-wise and pound-foolish" policy of years since. For want of timely expenditure, the damage to property was much greater than it would have been, and truly dreadful and incredible to those who have not seen the devastation. We have a narrow esplanade before our largest mansions, at that very part, too, of the shore most exposed to the sea. Everything is conducted in the same niggardly spirit, which, instead of saving money, adds to expense, drives away visitors, and deters the best people from coming here at all. Our roads, too, are dreadful. The Council have ordered a "steam roller," but have no proper material yet to roll in.

In the interests not only of these towns, but in the general public interest, I beg to ask your close notice of our case. Owing to many, many years of misrule and favouritism, there is everything to be done to secure the public from imposition, particularly as to health and very life, and to place Hastings and St. Leonards so that conscientiously they may be called first-class watering-places.

A Sufferer.

THE EDUCATION OF THE ARTISAN.

Sir,—In the letter of mine on which you comment last week, I was dealing, of course, only with the utilitarian value of technical education. What I maintain is this,—that as regards working power the qualities which characterise our race, such as energy and perhaps conscientiousness, are more potent and extensive in their application than any mere grafting in the way of technical education ever can be. No doubt, other things being equal, a technically-educated workman would, in certain contingencies, have an undeniable advantage over one not so furnished, but the increasing specialisation of employments through the division of labour renders such contingencies less and less likely to arise.

What we may call the æsthetic value of technical education cannot be questioned, and yet even here we see the insufficiency of "provinciality," for the man who understands the principle of the lever and the composition of forces, if he knows nothing of history or literature,—if, in other words, he is destitute of that broader education which we call culture,—is not likely to be, and, in fact, is not much of an artist-artisan.

Sir A. Helps observes that "the shortest way, even to the good, which is of a purely physical character, lies often through the highest moral considerations." This is an admirable sentiment; to it I would add that those agencies which tend to keep up the vigour and *morale* of the people do far more to maintain our manufacturing supremacy than agencies which appear to be more special and direct.

This, of course, in no way traverses the sentiment or advice given in your article, which I wish earnestly might be read by every working man in England; for we are yet a long way from your ideal, and I sometimes wonder whether we are even moving towards it.

A Bedford Artisan.

MR. GLADSTONE'S CORRESPONDENT.

Sir,—My few words to Mr. Gladstone, kindly referred to in your leading article of last week, were written in full remembrance of the fact that it is conceivable for a workman whose mind is impressed with aspirations for the æsthetic ideal of mental development, to view the higher departments of his calling as fields in which the intellect is tied up rather than permitted that "most unbounded scope" which Mr. Gladstone emphasised as open to it.

Francis Moore.

CHURCH RESTORATION IN THE NINETEENTH CENTURY.

Sir,—The beautiful Church of Allhallows, Barking, after having been closed for some time, was opened on Sunday last. Its circular and hexagon columns, Norman and Early English arches, have all been smothered with paint and whitewash. Those who have been overseers of the restoration must have been Mr. Blindman and Mr. Wantwit.

A Laughing-Stock.

TECHNICAL EDUCATION.

The Council of the Architectural Museum have again drawn the attention of several of the City Companies to their efforts to promote the technical culture of workmen engaged in manufactures in any way allied to art.

The Council pointed out the many advantages to be derived from study in such a museum as they have been enabled to collect, and are able to announce, that owing partly to the generosity of some public bodies, and partly to an economical rearrangement of their official staff, they have been able temporarily to provide a teacher who has been highly recommended to them, and this autumn a fresh start has been made towards re-establishing the modelling and drawing classes.

With the view of making the arrangement permanent, the Council again seek the aid of those who may be interested in an enterprise so important for the public as this is, and who have funds at their disposal to promote it.

It may be interesting to mention that the Council have lately secured, as an addition to the collection, a portion of the ceiling of Carpenters' Hall.

BUILDERS' BENEVOLENT INSTITUTION.

The forty-fourth election of pensioners in connexion with this Institution took place on Thursday, the 25th inst., at Willis's Rooms, St. James's. The poll was open from 12 noon to 3 p.m. In the unavoidable absence of the president (Mr. John Aird, jun.), Mr. Dines, past-president, and Mr. T. G. Smith, presided at the opening and close of the poll respectively.

There were five candidates, of whom two were to be elected, one male and one female. The candidates were:—Evan Jones, 66, plasterer (4th application), who received 1,590 votes; William Stribling, 72, carpenter (3rd application), 2,423 votes; Thomas Richardson, 66, builder,—a subscriber to the Institution for fourteen years (1st application), 2,672 votes; Henry Atkins, 72, builder (1st application), 1,068 votes. The only female candidate was Mrs. Charlotte Day, who received 1,589 votes. Shortly after three o'clock, the chairman declared the successful candidates to be Thomas Richardson and Mrs. Day. A lady sent (per Mr. Waldram), 5*l.* 5*s.* for the male candidate who was second on the poll, and this sum was

accordingly handed to Stribling. Votes of thanks to the scrutineers (Messrs. Matthew Hall and F. W. Keeble), to the chairman, &c., concluded the proceedings.

A MARBLE PAVEMENT.

SIR,—As there appears to be some misapprehension on the subject, may we ask for space in your next issue to state that the Marble Mosaic Pavement now being laid in Mr. Albert Grant's mansion at Kensington, was prepared, and is now being laid, by Venetian workmen in the employment of THOMAS ORR & Co.

TEMPLE GARDENS.

SIR,—To prevent disappointment to any one, kindly let me state in the next number of the *Builder* that the old tree referred to by your correspondent, Nathaniel Waterall, has had to be removed to make room for the new buildings that are to be erected in the gardens. It was a fine specimen of the *Catalpa syringiflora*, and is said to have been planted by Sir Matthew Hale. Such parts of it as were found to be sound have been taken care of, and will be made up into several useful articles. It belonged to the Middle Temple Garden.

THE CLERK OF WORKS.

ACTION AGAINST A BUILDER.

THE case of Lord Bateman *v.* Thompson came before the Common Pleas Division of the High Court of Justice on the 18th inst. (sittings *in Banco*) before Lord Coleridge and Justices Grove and Archibald.

It appeared that in 1856 the defendant entered into a deed by which he covenanted for 12,260*l.* to do certain works, additions, and alterations to Shobden Court, Herefordshire, the seat of Lord Bateman. He also covenanted that the work should be done in a substantial and workmanlike manner, and of the best materials of their several kinds, to the satisfaction in all respects of the architect and of the said Lord Bateman. The action was founded upon the allegation that the work had not been done in accordance with this covenant; and it was contended that even though the architect had certified that the work had been done to his satisfaction, which, however, was not admitted, yet, still that Lord Bateman was not precluded from suing upon the ground that the work had not been done to his own satisfaction, and that improper materials had been used.

Mr. Matthews, Q.C., for the plaintiff, stated that improper stone and other materials had been used; and the consequence was that very great expense had been incurred in remedying the mischief so caused. It was specially said that the stone used on the external part of the structure had gone to pieces from exposure; and a number of photographs were handed in to show what was the state of the building.

Lord Coleridge said that it was clear from the photographs that Lord Bateman had good ground to complain against somebody, but still the judgment must be for the defendant. The work had been completed, the architect had certified, and his lordship had accepted that certificate and paid upon it. Lord Bateman himself thus expressed his satisfaction with the work, and no doubt he was then satisfied with it. This being so, the action could not be maintained by him upon the deed.

Judgment for the defendant.

KURRACHEE AND MADRAS HARBOUR WORKS.

FROM a report just published, it appears that, during the past year, the water-space in the new Kurrachee harbour has been lessened by nearly 4½ millions of cubic feet by the accumulation of silt brought down from the New Channel and Chinna-creek back-waters. Bar-dredging now means simply improving the entrance-channel. This channel, formed through the old bar, is intended to be 500 ft. wide and 20 ft. deep at low water springs, datum level. This may be said to have been practically effected; for except that soundings of a few inches less than 20 ft. are to be obtained along the edges of the channel, there is nothing to prevent vessels drawing less than that quantity of water from passing freely in or out of the harbour at all times and tides. Even heavily-laden vessels of 24 ft. draught can pass in or out at certain times and places on any day of the year. The dredge was employed on this work during the first and last three months of the official year, and removed 91,500 tons (1,830,000 cubic feet) of sand and rock which had previously been loosened by the divers, the cost being at the rate of 13½d. per ton. A party of dress-divers was employed during five months and a half in blasting and removing rock from the bottom of the channel. In their operations 412 tons of rock were raised and removed at an expenditure of 1,850 lb. in gunpowder and 800*l.* in money. The Manora section of the breakwater stood the effects of the south-west monsoon very satisfactorily. Only three concrete blocks were washed out, and these from the extreme end; and with them was carried away the temporary iron beacon placed on them. One of these blocks was replaced by a mass of concrete formed *in situ*; but the two outer blocks have not been restored, as it is uncertain whether the substructure is sufficiently undisturbed to make immediate restoration advisable. The settlement of the breakwater during the year amounted to less than 2 in. in the older portions of the work, and to from 3 in. to 6 in. at the outer end in the work last completed (1872-73). The whole settlement has been uniform for the last hundred yards of the extremity of the work, and has amounted in all to about 3 ft. at the end. Little denudation of the base has occurred.

Mr. May, the local superintendent of the Madras Harbour Works, has submitted a revised estimate for the works, amounting to 640,000*l.*, and a list of the buildings on the beach that will have to be removed has been sent in to the Government. In the case of this undertaking, at least, the Government of India seem disposed implicitly to abide by Lord Salisbury's instructions with regard to the strict economy which ought to be observed with reference to public works, and have refused to sanction the construction of a short double line of railway which was proposed for conveying laterite to the work, it being considered that the existing single line will suffice if used during the hours at night when it is not otherwise employed.

Mr. Beardmore, a concrete-maker, has already arrived at Madras, and Mr. Bhimaya Saenna, one of the native engineers who was connected with the Kurrachee Harbour, is expected to assist in the new construction. The site for the foundation-stone, which is to be laid by the Prince of Wales, has been fixed, and the local Masons have secured and will prepare a room in one of the buildings on the beach for a lodge. Meantime, the Government have ordered the firm of Orr & Sons to manufacture a handsome silver trowel for the use of his Royal Highness. It will bear on the obverse an appropriate inscription surrounded by a richly-engraved border; and on the reverse, a sketch in outline of the proposed harbour, from a design by Mr. May, C.E., the engineer in charge.

TASMANIAN TIMBER.

FROM a special supplement of the Hobart Town *Mercury* for August 7th last, which, in view of the Melbourne and Philadelphia Exhibitions, gives a large mass of information as to the products of the colony, we glean some particulars as to the native varieties of timber.

The principal timber-trees of Tasmania, such as blue gum, stringy bark, white gum or gum-topped stringy bark, swamp gum, and peppermint-tree, furnish a hard, close-grained, and strong timber, which is used in shipbuilding and house-building, and generally for all the purposes to which oak is applied in England. Huon pine is very durable, and is employed for boat-building, for which it is peculiarly adapted, and for house-fittings, &c. Black-wood makes excellent naves and spokes, cask-staves, &c. Native myrtle is valuable for house-fittings. Swamp gum yields the finest palings and other split stuff in the world. Sassafras affords timber for house-fittings, bench-screws, lasts, &c. Celery-topped pine is chiefly used for masts and ships' spars. The different kinds of timber in the following list are arranged according to their value. The diameter of the trees is measured at the height of 4 ft. from the ground.

Blue Gum (*Eucalyptus globulus*, Lab.).—The common name is derived from the bluish-grey colour of the young plants. Diameter, 5 ft. to 30 ft.; average of those felled for use, 6 ft. Height, 150 ft. to 350 ft. Specific gravity about ·945 to 1·055. Abundant in the southern and south-western parts of the island. Cut for house-building, it sells at 8s. to 10s. per 100 superficial feet; for shipbuilding, at 12s. to 14s.

Stringy-Bark (*Eucalyptus obliqua*, Lher.).—Common name taken from the coarse fibrous bark. Diameter, 4 ft. to 24 ft.; average of those sawn about 5 ft. 6 in. ft. Height, 150 to 300 ft. Sp. grav. about ·905. Abundant everywhere upon hilly ground. Price, the same as that of Blue Gum.

Swamp Gum—White Gum (*Eucalyptus viminalis*, Lab.).—Common names from its growing to perfection in humid situations,—and from its gigantic white trunk. Diameter, 4 ft. to 18 ft.; average about 5 ft. 6 in. Height, 150 ft. to 300 ft.; sp. grav. about ·885. Growing in forests with other kinds of *Eucalyptus*, in rather humid localities. A small variety called the Manna Tree grows abundantly about Hobart Town and in other places, on dry ground. Price, for general purposes, the same as that of blue gum; 5-ft. palings, 6s. to 8s. per 100.

Gum-topped Stringy Bark sometimes called White Gum (*Eucalyptus gigantea*, var.).—A tree resembling the blue gum in foliage, with rough bark similar to Stringy Bark towards the stem. It has been found recently that this wood possesses nearly all the properties of strength, solidity, and durability of the blue gum,—whilst being straight-grained, it is much easier to work. It is very abundant about D'Entrecasteaux Channel. Price, about the same as blue gum.

Peppermint-tree (*Eucalyptus amygdalina*, Lab.).—Common name from the odour of the leaves. Diameter, 3 ft. to 8 ft.; average, about 4 ft. Height, 100 ft. to 150 ft.; sp. grav., about ·895. The peppermint-tree abounds throughout the island, on gravelly and other poor soil. Price, about the same as that of swamp gum.

Huon Pine (*Dacrydium Franklinii*, Hook., fil.). So called because it was first discovered on the banks of the Huon River. Diameter, 3 ft. to 8 ft.; average, about 4 ft. 4 in. Height, 50 ft. to 120 ft.; sp. grav., about ·650. Abundant in portions of the south-western part of the island. Price, about 16s. per 100 superficial feet, in the log.

Blackwood (*Acacia melanoxylon*, Br.).—So called from the dark-brown colour of the mature wood, which bcomes black when washed with lime-water. In moist, shady localities the tree grows more rapidly, and the wood is of a much lighter colour. Hence this variety is called "Lightwood" (in Hobart Town), to distinguish it from the other. Diameter, 1 ft. 6 in. to 4 ft.; average, about 2 ft. 3 in. Height, 60 ft. to 130 ft. Sp. grav., about ·835. Found throughout the island, but not abundantly in any one locality. Price, about 12s. to 14s. per 100 superficial feet, in the log.

Beech or Native Myrtle (*Fagus Cunninghamii*, Hook.).—Common name from the fancied resemblance of its dark-green leaves to those of the myrtle. Diameter, 2 ft. to 9 ft.; average, about 3 ft. 6 in. Height, 60 ft. to 180 ft. Sp. grav., about ·795. The native myrtle exists in great abundance throughout the western half of the island, glowing in forests of great size, in humid situations. Price, about 16s. per 100 superficial feet, in the log.

Celery-topped Pine (*Phyllocladus rhomboidalis*, Rich).—So called from the fancied similarity in form of the upper part of the branchlets to celery. Diameter, 1 ft. 3 in. to 2 ft.; average, about 1 ft. 6 in. Height, 60 ft. to 150 ft. Sp. grav., about ·655. Rather common in damp forests in the southern parts of the island, and in some sub-Alpine localities.

ORNAMENTAL WOODS.

The different kinds of wood included in the following list are all in constant use for cabinet and fancy work. They are arranged according to their value. The finest specimens of native myrtle, musk-wood, huon pine, and blackwood, exhibit qualities of the highest excellence, both in tint and variety of vennation.

Beech or Native Myrtle (*Fagus Cunninghamii*, Hook.).

Musk Wood (*Olearea argophylla*, F. Mueller).—Named from the musky odour of the plant. Diameter, 6 in. to 1 ft. 3 in.,—the butt enlarging towards the ground to 1 ft. 6 in. and even 2 ft. 6 in. Height, 15 ft. to 30 ft. Sp. grav. about ·685. Abundant throughout the island in damp localities.

Huon Pine (*Dacrydium Franklinii*, Hook., fils.).

Black-wood (*Acacia melanoxylon*, Br.).

She-oak (*Casuarina quadrivalvis*, Lab.).—A portion of the common name is evidently derived from the resemblance of the markings to those of oak. Diameter, 1 ft. to 1 ft. 6 in. Height, 20 ft. to 30 ft. Sp. grav. about ·845. Very common on dry stony hill, excepting in the north-western districts.

He-oak Casuarina suberosa, Otto.).—Diameter, 9 in. to 1 ft. 3 in. Height, 20 to 25 ft. Sp. grav. about ·855. Common on stony hills.

Honeysuckle Tree (*Banksia Australis*, Br.).—Named from the large quantity of honey in the flowers. Diameter, 1 ft. 6 in to 2 ft. 6 in. Height, 20 ft. to 40 ft. Sp. grav. about ·645. Abundant on sandy soil.

Dogwood (*Bedfordia salicina*, D.C.).—Diameter, 6 in. to 1 ft. 4 in. Height, 15 ft. to 25 ft. Sp. grav. about ·985. Common of small size, but rare of large proportions.

Native Laurel (*Anopterus glandulosus*, Lab.).—So named from its laurel-like leaves. Diameter, 6 in. to 10 in. Height, 15 ft. to 20 ft. Sp. grav. about ·675. Tolerably abundant in some sub-Alpine localities.

Blue Gum (*Eucalyptus globulus*, Lab.).—Curly-grained variety.

Peppermint (*Eucalyptus amygdalina*, Lab.).—Some specimens of this timber have a very fine wavy marking.

The following are some

USEFUL WOODS.

Silver Wattle (*Acacia dealbata*, Lindl.).—So called from the whiteness of trunk, and the silvery green of the foliage. Used for cask-staves and trenails. Diameter, 1½ ft. to 2½ ft. Height, 60 ft. to 126 ft. Sp. grav. about ·965. Very common.

Iron Wood, Tasmanian (*Notelæa ligustrina*, Vent.). — An exceedingly hard close-grained wood, used for mallets, sheaves of blocks, turnery, &c. Diameter, 9 in. to 18 in. Height, 20 ft. to 35 ft. Sp. grav. about ·965. Not uncommon.

Swamp Tea-tree (*Melaleuca ericæfolia*, Sm.).—So called, probably, because the leaves of an allied plant (*Leptospermum lanigerum*, Sm.) with similar bark are said to have been used as a substitute for tea. Diameter, 9 in. to 20 in. Height, 20 ft. to 60 ft. Sp. grav. about ·824. Used for turnery chiefly.

Native Cherry (*Exocarpus cupressiformis*, Lab.). so named because the colour of the fruit is similar to that of a Kentish cherry. Diameter, 9 in. to 1 ft. 3 in. Height, 20 ft. to 30 ft. Sp. grav. about ·785. Used for tool-handles, spokes, gun-stocks, &c.

White-Wood (*Pittosporum bicolor*, Hook).—Wood, white. Diameter, 8 in. to 1 ft. 1 in. Height 20 ft. to 35 ft. Sp. grav. about ·875. Used in turnery; probably fit for wood-engraving.

Native Box (*Busaria spinosa*, Cav.).—The leaves are somewhat like those of the English box. Diameter, 8 in. to 1 foot. Height, 15 ft. to 25 ft. Sp. grav. about ·825. Used for turnery.

Pink-Wood (*Beyeria viscosa. Croton viscosum.* Lab.)—Diameter, 6 in. to 10 in. Height, 15 ft. to 25 ft. Sp. grav. about ·815. Used for sheaves of blocks and for turnery.

Native Pear (*Hakea lissosperma*, Br.).—The woody seed-vessel is somewhat pear-shaped. Diameter, 8 in. to 1 ft. Height, 29 ft. to 30 ft. Sp. grav. about ·675. Fit for turnery.

SCHOOL BOARD SCHOOLS.

Cannock.—At the meeting of the Cannock School Board, on the 4th inst., Mr. Scrivener, architect, Longton, submitted four tenders for the erection of two schools, one at Walsall-road, Cannock, and the other at Rawnsley:—Messrs. Adams & Pemberton, Stafford, Cannock school, 6,746*l.*; Rawnsley school, 2,718*l.* Mr. Whittam, Stafford, 6,387*l.* and 2,688*l.* Messrs. J. Crisp & Son, Cannock, 6,166*l.* and 2,750*l.* Mr. N. Barlow, Stoke-on-Trent, 6,339*l.* and 2,470*l.* The last-named tender was accepted. Two other schools are now in course of erection at Hednesford.

Arbirlot.—At a meeting of the Arbirlot School Board, held on the 6th inst., plans of a proposed new school were finally approved. The building, which is from designs by Messrs. Aitkenhead & Mason, architects, Arbroath, will accommodate 130 scholars.

Dryfesdale.—The new public schools at Dryfesdale were formally opened on the 8th ult. The architect is Mr. Barbour, Dumfries. The buildings, the style of which is Gothic, are substantial. They contain school accommodation for upwards of 600 pupils. The school-rooms, of which there are six, measure about 22 ft. in width and 19 ft. in height, are well lighted and ventilated by opening-windows and roof-ventilators. The rooms are to be heated by large Gill-stoves. The cost, exclusive of site, will be about 4,500*l.*

Huddersfield.—The Berry Brow School, one of the series contemplated by the Huddersfield School Board, has just been opened. The style is Gothic, and accommodation is provided for 400 children. Mr. Edward Low, of London, is the architect, and Mr. Cairns was clerk of the works. The contractors were:—Excavators, bricklayers, and stonemasons, A. Graham & Sons, Huddersfield; carpenters and joiners, Messrs. Kirby & Scholes, Hillhouse; tilers, Messrs. W. Goodwin & Sons, Huddersfield; plasterer, Mr. Nathan Jessop, Berry Brow; plumber, Mr. G. Garton, Huddersfield; iron-mongery and heating apparatus, Mr. J. Brook, Huddersfield; painter, Mr. G. Moxon, Huddersfield.

Epworth.—New school-houses and masters' residence are in course of erection at Epworth, for the School Board. Mr. Henry Kelsey, of Epworth, has obtained the contract for the erection of the buildings, which are to cost 1,386*l.*

Inverness.—At the monthly meeting of the Inverness Burgh School Board, on the 9th inst., plans for the new Central and Merkinch Schools, amended in accordance with suggestions made by the Education Department, were discussed. Messrs. Ross & Lawrie are the architects.

Cowpen.—The plans of Mr. John Gibson, architect, of Newcastle and Ryton, have been selected by the Cowpen School Board.

East Markham. — The designs by Messrs. Clarke & Son, architects, of Nottingham, have been selected for the Board Schools and master's house, about to be erected at East Markham, near Tuxford, Nottinghamshire.

Miscellanea.

London Anthropological Society.—On the 12th inst., the president, Dr. Charnock, read a paper on the "Origin of the Etruscans and their Language." The author traced the Etruscans to a Pelasgic colony from Lydia, otherwise called Mœonia. After referring to traditions, both Lydian and Etruscan, and to numerous classical authors in support of the theory, and to certain geographical names in Etruria, the author showed that the Etruscans resembled the Lydians in habits, manners, customs, and dress, and also in their sepulchral monuments; that their musical instruments were derived from Lydia, whence were introduced their stage-players, dancers, sports, games, and shows; that the appellation of the people may be traced to the name of a place at the foot of the Mesogis Mountains in Lydia, and that Etrusci, Tusci, and Rasena are etymologically the same word. There is no evidence of the Turanian origin of the Etruscan language, which is based upon the Old Pelasgic. It contains a few words from Persian and Phœnician, but none from the Celtic or Gothic-Teutonic languages. A great many words may be traced to the Greek; a lesser number are from, or allied to, the Latin.

Discovery of an Ancient Mural Painting.—We recently chronicled the re-opening of the new chancel at Cranbourne Church, Dorset. We now learn that in the course of the works a mural painting was discovered. The group consisted of ten figures, arranged in positions beneath the crucified Redeemer. Immediately under the arms of the cross, on either side, were two graves, the shrouded occupants with uplifted hands in prayer; again on either side were two crowned figures, supposed to be the Earl and Countess of Gloucester, patrons of the church, and behind them were guardian angels, 5 ft. in height, standing, all the other figures kneeling. At the foot of the cross, on either side, were a male and female figure with scrolls, the woman imploring for the dead, "*Voca me cum benedictis*"; the man supplicating for all, living and dead, "*Jesu, miserere nobis.*" Under the right arm of the cross, between the living and dead, as being dead to the world, was a nun, and below all, on the right, a man supposed to be the designer. The subject was painted on the stone. The ground colour was red, and between the figures, here and there, were lily-blossoms.

New Post Offices at Oldham and Rochdale.—Messrs. Neill & Sons, of Manchester, have received orders from Her Majesty's Office of Works to proceed with the erection of a new post-office for Oldham, at the corner of Union-street and Greaves-street. The building is to be erected from the designs of Mr. James Williams, of Her Majesty's Office of Works, and will be in many respects similar to the office reopened at Rochdale last week. The latter building is in the Grecian style, the principal façade being of fine Yorkshire stone. The area covered is 95 ft. by 32 ft. The front portion of the building is four stories high, including the basement. The principal office is in the front, and is approached by a vestibule. At the extreme back is a large room for sorting letters, this room being 51 ft. long by 26 ft. wide, and having an open timbered roof on iron principles. The builders have been Messrs. Robert Neill & Sons, Manchester. The cost has been about 7,000*l.*

Proposed Docks at Wisbech.—Mr. Abernethy, C.E., has prepared an estimate for a dock, &c., at Wisbech, the total cost of which, exclusive of cost of land, is 190,000*l.* It is calculated that the entire cost would be about a quarter of a million of money.

Breach of Contract.—Handley *v.* **Sanders.**—In this case, which came before the Longton County Court on the 9th inst., the plaintiff, a joiner of Longton, sued the defendant, a jeweller of the same place, for 14*l.* (including 15*s.* as cost of plaint) being the balance of an account of 29*l.* 10*s.* for work performed. The evidence showed that the defendant engaged the plaintiff to do some work at two houses he was building at Normacott, and a contract was entered into for the completion of the work for the sum of 50*l.* After doing a portion of the work, the plaintiff left it standing, alleging that he was unable to finish it in consequence of the defendant refusing to advance him money. Finding the work standing unfinished, the defendant gave the plaintiff a written notice stating that if it were not finished forthwith he would engage other workmen to go on with it, and charge him with any loss he might sustain. The plaintiff had not, however, finished the work, and Mr. Sanders said he had suffered a loss of about 20*l.* in consequence. The judge found for the defendant.

Utilisation of Tin Plate Waste.—An invention by Mr. F. G. Morton, of Bermondsey, proposes to utilise tin-plate scraps and clippings and waste articles made of tin-plate, such as Australian and other meat and preserved fruit tins and the like. Such scraps, clippings, and waste articles are utilised by separating the tin, solder, and lead from the iron, so that the tin, the solder and the iron are rendered available for use. For the purpose of separating the tin, solder, and lead from the iron the waste articles are subjected in a reverberatory furnace to the action of heat, the temperature being such as to melt the tin, solder, and lead without burning the same in melting the iron. The tin, solder, and lead having been removed from the iron, the iron plates are further treated by means of muriatic acid, allowing them to drain, and finally are washed in an alkaline bath or in water.

The Royal Society.—The award of the medals in the gift of the Royal Society for the present year, by the Council, is as follows:—The Copley Medal to Professor A. W. Hofmann, F.R.S., for his numerous contributions to the science of chemistry, and especially for his researches on the derivatives of ammonia; a Royal Medal to Mr. William Crookes, F.R.S., for his various chemical and physical researches, more especially for his discovery of thallium, his investigation of its compounds and determination of its atomic weight, and for his discovery of the repulsion referable to radiation; a Royal Medal to Dr. Thomas Oldham, F.R.S., for his long and important services in the science of geology, first as Professor of Geology, Trinity College, Dublin, and Director of the Geological Survey of Ireland, and chiefly for the great work which he has long conducted as Superintendent of the Geological Survey of India.

The Bargate, Southampton.—At a meeting of the Southampton Literary, Philosophical, and Statistical Society, held at the Hartley Institution on the 12th inst., a paper was read by Mr. B. W. Greenfield on "The Heraldry and Exterior Decorations of the Bargate." Much information was given concerning the eleven coats of arms on the north side of the Bargate. It was sought to show that, contrary to local historians, the arms of Abdey, Lych, Lewis, Lethiruller, and Hewitt are not on the Bargate; whilst the coats unknown to them were those of De Cardonnel, Leigh, and Newland. The bad condition of the eleven shields was noticed, and warning was given of their yet more rapid decay unless speedily restored, a hope being expressed that the Mayor and Corporation will no longer allow these memorials of the past to remain in their present neglected condition.

The Sheffield Architectural and Archæological Society.—"Spectator in Hallamshire," writing in the *Sheffield Independent*, says:—"A proposal is under discussion for the conversion of the Sheffield Architectural and Archæological Society into a section of the Literary and Philosophical Society, and I have good hope that it will come to perfection. Such adhesions would add strength and dignity to the older society, and if the example is set by the archæologists perhaps other societies might be tempted to follow. There may perhaps be some little loss of dignity, if any such exists, in merging an independent society into a section, but there would be the great gain in alliance with an old and strong society with rooms and a library at its service."

The Dublin Main Drainage Scheme.—At a meeting of the Dublin Town Council, on the 20th inst., a letter was read from Sir Michael Hicks-Beach, chief secretary for Ireland, announcing that the Public Works Loan Commissioners had refused to lend the Corporation half a million of money for the purpose of carrying out the main drainage works of Dublin, on the ground that there was nothing which the Corporation could tax at present for the purpose of security that could bear further taxation, and suggesting that some new security should be devised. The Council passed a resolution declining to consider the matter further.

Pwllycwchon and Colwyn Bay Estate.—It is intended to develop a new watering-place on the Welsh coast which shall exceed in beauty and geniality of temperature any of its predecessors. A Manchester company have purchased the Pwllycwchon estate, of over 660 acres, from Mr. John Pender, and are laying it out in building plots for mansions, villas, and other dwelling-houses. A considerable quantity of land has already been sold, and it is expected that very extensive building operations will be commenced in spring. Mr. L. Booth, of Manchester, has been appointed agent to the company.

Rail-rolling Extraordinary.—The capabilities of the steelworks belonging to the Ebbw Vale Company have just been tested. A few days ago arrangements were made by Mr. J. J. Richards, manager, for the rolling of two steel rails of extraordinary length, weight, and quality. The first rail brought out was a T head rail, and its length is 74 ft. 6 in.; it weighs 16 cwt. 6 lb. The length of the second rail, a double-headed one, is 89 ft. 7 in. The weight, calculating 78 lb. per yard, is 1 ton 3 qrs. 14 lb. Both rails are good specimens of workmanship. These rails are stated to be the longest and heaviest ever rolled.

Smoke-Washing Apparatus for Factory Chimneys.—An apparatus for washing smoke, and so depriving it of its character of a nuisance, is in operation at a factory at Menilmontant, Paris. A fine shower of water, travelling in the direction of the smoke, and at five times its velocity, is projected into the chimney, where it mixes with the smoke, taking up the soluble gases, and precipitating the impurities carried up with the smoke by the draught. The foul water is discharged into a cistern, where it is collected, and a fine black paint is got from it. The arrangement is not a novelty in England.

National Penny Bank.—The objects of this organisation are to promote thrift by affording facilities for the exercise of thrift, which are not at present afforded by the Post Office or other Savings Banks; to establish a Permanent Penny Bank in every district, in every school, and in every workshop; to make such Penny Banks absolutely safe, self-supporting, and on a commercial basis; and to enable persons to become National Fundholders and possessors of Consols, by purchasing at the market price small sums of 16s. 8d. or more at a time.

Artisans' Dwellings at Birmingham.—The Birmingham Town Council have resolved to put in force the powers of the Artisans' Dwellings Act on a larger scale than they at first contemplated. At a special meeting on the 17th inst., the Council adopted a recommendation by the medical officer that the extent of the "unhealthy area" with which they propose to deal should be increased from 43 to 93 acres. The work will be done gradually, and a considerable proportion of the sum voted will be employed in the widening of streets.

New Harbour at Wardshore, N.B.—A harbour is at present in course of construction at the fishing-village of Wardshore, Aberdeenshire. It is being formed of concrete; the contractors are Messrs. Bisset & Son, Aberdeen; and the engineer is Mr. Willet, C.E. The boats belonging to Wardshore had always to go to other ports to fish during the herring season, and to remedy this inconvenience the proprietor, the Earl of Erroll, resolved to build a harbour to contain 200 boats.

New Reservoir at Guisbrough.—A storage reservoir in connexion with the waterworks at Guisbrough, situated two or three miles to the south-east of the town, has just been completed, under the direction of the engineer to the Guisbrough Water Company, Mr. Sheriton Holmes, of Newcastle. The reservoir covers about six acres, and it has been constructed to hold 8,000,000 gallons of water. The drainage area is from three to four miles.

The Jarrow Carpenters and Joiners.—On the 13th inst. a mass meeting of the carpenters and joiners employed in the Tyne shipbuilding yards was held at Jarrow, when twenty-four rules, as drawn up by the masters, were unanimously adopted. With respect to the proposed 10 per cent. reduction, a motion was passed that the men do not submit to any such reduction. A resolution to the effect that no overtime should be worked in any of the yards until the wages question had been definitely settled, was also agreed to.

Another Aquarium Project.—With the object of preserving the neighbourhood of the Dingle, Liverpool, from eventual absorption in small house building, and securing it to the public in its full beauty as a quasi-rural resort, Mr. C. O. Ellison and some other gentlemen have prepared plans for the establishment in the vicinity of the Dingle of an aquarium and pleasure-gardens.

The Lighting of Common Stairs.—The Partick Magistrates have fined a factor for failing to supply gas on the stairs of tenements under his charge. The defender held that his duty was discharged when he fitted up the requisite pipes and lamps in the stairs, but the magistrates maintained that he must supply gas as well. An appeal is made to the High Court.

The Proposed Schools at Darenth.—At the last meeting of the Metropolitan Asylums Board it was resolved "That the alterations suggested by the committee in the plans of Messrs. Harston, for the proposed schools for imbecile children at Darenth, be approved and adopted, and that the plans as amended be forwarded to the Local Government Board for their approval."

The Dundee Masons' Wages.—It is stated that the dispute between the Dundee masons and their employers, in regard to a reduction of wages, has been settled, and therefore no strike will now take place. The masters have agreed to the request of the men that the wages be 8½d. per hour, with full time guaranteed, and 9d. per hour when the men have to take their chance of the weather.

Proposed Art School for Kidderminster. The Mayor of Kidderminster (Alderman Goodwin) has presented to the people of Kidderminster a centrally-situated piece of land, worth about 1,000*l.*, as a site for an institute, to include a school of art, science classes, lecture-theatre, exhibition-room, free library, reading-room, &c.

"The Brighton" Art Union.—The Corporation of Brighton have arranged an Art Union in connexion with the present Exhibition of Modern Pictures, held in the Galleries of the Free Library and Museum, Royal Pavilion, Brighton. The secretary is, appropriately enough, Mr. Wonfor.

Strike of Masons at Montrose.—The masons in the employ of Mr. Ford, Mr. Reith, and Mr. James Mitchell, builders, are at present out on strike. They had received intimation that their wages were to be reduced from 7½d. to 7d. per hour, and, rather than submit, have struck work.

Proposal for Utilising Her Majesty's Theatre.—It is stated that an influential company is in process of formation for the acquirement of the Earl of Dudley's interest in Her Majesty's Theatre in the Haymarket, and that the preliminaries have been partially concluded for the formation of a West-end Stock Exchange.

Society of Arts.—A paper on the Registration of Trade Marks was read on the 24th inst., by Mr. H. T. Wood, the editor of the *Society of Arts Journal*. We are compelled, however, to postpone any quotation from it.

Her Majesty the Queen has been graciously pleased to accept from the Art-Union of London an artist's proof of "The Death of Nelson," engraved for the Society by Mr. Sharpe, from the original by the late Daniel Maclise, R.A.

TENDERS

For additions to the "Crab and Lobster," Ventnor, Isle of Wight. Mr. Francis Newman, architect. Quantities supplied:—

Moses & Wallder	£4,907 0 0
Barton	4,805 0 0
Meader	4,800 0 0
Ingram & Son	4,715 0 0
Sibley	4,549 0 0
Daish	4,500 0 0
A. & A. Newnham (accepted)	4,119 0 0

For the erection of printing and publishing offices of the *Manchester Courier and Evening Mail*, and warehouses and chambers at Cannon-street, Manchester, for Mr. Sowler. Mr. John Wolstencroft, architect. Quantities by Mr. Leonard Campbell:—

Thompson	£12,125 0 0
Southern	12,110 0 0
Foggett (accepted)	11,962 0 0

For alterations and additions to the "Empress of Russia," John-street-road, for Mr. Crozier. Mr. Thomas Parker, architect:—

Bodman	£2,269 0 0
London Artisans' Building Co.	1,850 0 0
Burton	1,387 19 0
Smailes & Taylor	1,212 10 0

Accepted for schools for 460 children, master's residence, board-room, boundary-walls, and playgrounds, at Woodhouse, for the Normanton School Board. Mr. William Watson, architect:—

Gibson	£4,420 0 0

Accepted for six houses in Manygates Park, Wakefield. Mr. W. Watson, architect:—

Elvey (excavating, brick and stone work)	£1,280
Craven & Lloyd (carpenter and joiner's work)	768
Driver (plastering)	200
Kirk (plumbing, glazing, and iron work)	180
Rycroft (slating)	130
Moxon (painting)	40

For the erection of a warehouse to be called "Damon's Buildings," Shepherdess-walk, City-road. Mr. James Harrison, architect. Quantities by Mr. H. T. Gordon:—

Ashby, Brothers	£3,596 0 0
Browne & Robinson	3,321 0 0
Manley & Rogers	3,285 0 0
Ennor	3,203 0 0
Merritt & Ashby	3,133 0 0
Little	3,041 0 0
Wall, Brothers	3,014 0 0
Johnson, Brothers	2,913 0 0
Crabb	2,878 0 0
Bowman	2,774 0 0

For rebuilding the "Lord John Russell," City-road, for Messrs. Truman, Hanbury, Buxton, & Co. Mr. W. E. Williams, architect:—

Marr	£1,288 0 0
Ennor	1,198 0 0
Eton	1,170 0 0
Anley	1,140 0 0

For rebuilding portion of factory, 13, Holland-street, for Messrs. Wildey & Co. Mr. H. W. Hayward, architect:—

Baguley	£812 0 0
Linden	800 0 0
Anley	747 0 0

For repairs and decorations at the Neptune Tavern, Clarendon-street, Somers Town, for Mr. J. W. Dawson. Messrs. Bird & Walters, architects:—

Perkins	£283 0 0
Williams	277 0 0
Anley	249 0 0

For school, Fairfield-road, Bow, for the School Board for London. Mr. E. R. Robson, architect. Quantities by Mr. W. H. Barber:—

Roberts	£7,282 0 0
Kirk & Randall	7,275 0 0
Boyce	7,114 0 0
Williams & Son	7,102 0 0
Newman & Mann	7,086 0 0
Smith	7,076 0 0
Coleman	7,042 0 0
Sheffield	6,974 0 0
Hobson	6,937 0 0
Ennor	6,888 0 0
Wall, Brothers	6,878 0 0
Downs	6,870 0 0
Grover	6,664 0 0
Laurence	6,570 0 0
Timewell	6,514 0 0
Hook & Oldrey	6,399 0 0

For building two dwelling-houses, situate Station-road, Woolwich, for Mr. William Jackson. Messrs. William Gosling & Son, architects:—

Blake	£725 0 0
Cropper, Brothers	585 0 0
Hunt	578 0 0
Vickery	575 0 0

For laying out and planting the Hampstead Cemetery, Fortune-green-lane:—

Addison	£5,120 0 0!
Gardiner	4,221 0 0
Malter	2,900 0 0
Cutbush & Son	2,850 0 0
J. & A. Wright	2,567 0 0
Meston (accepted)	2,500 0 0
Whittle	2,207 0 0!

The War Department have accepted the tender of Messrs. Chandler & Sons, of York-street, Southwark, for alterations and additions to the Aldershott Camp Gas Works. The tender of the same firm has also been accepted by the Aberdare Local Board for 23,000 yards of pipe-laying.

Grimsby Schools.—The tender for these schools (Mr. C. Bell, architect), from Mr. J. Thompson, of Louth, 8,080*l.*, has been accepted.

TO CORRESPONDENTS.

W. P. G.—J. T. C.—M. M.—H. P.—J. & Son.—T. C. N.—J.—Rev. J. R.—E. L. P.—Dr. A.—A. H. C.—C. C.—J. C. M.—H. J. W.—B. M. C.—O. B.—J. G.—H. B.—J. A.—C. & Sons.—A. R.—J. E. G.—W. S.—G. C.—F. N.—T. A. R.—A. S.—J. D. M.—W. G. & Son—H. K. (list should be sent).—C. B. (let us see a drawing or photograph and plan).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, list of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.